SANITATION MARKETING SCALE-UP (SMSU 1.0)

END OF PROJECT REPORT

NOVEMBER 2014

iDE

Program Title:

Sanitation Marketing Scale-Up (SMSU) Project

Funders:

Water and Sanitation Program of the World Bank
The Bill & Melinda Gates Foundation
The Stone Family Foundation

Program Implementer:

iDE Cambodia

Date of Publication: November 2014

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Acknowledgements

There have been a number of people and organizations whose contributions have been instrumental to the success of the project. The authors' sincere appreciation goes to the following organizations and individuals.

The Water and Sanitation Program (WSP) of the World Bank, The Bill & Melinda Gates Foundation, the Stone Family Foundation, and the Ministry of Rural Development (MRD) for their support.

VisionFund, Kredit, Live & Learn, UNICEF, CFID, and Sentesena for their collaboration and contributions.

The project staff who brought the project to life: Ros Khemra, Klann Mab, Tek Makara, Om Sopheak, Seng Mongheng, Ou Savoeun, Lim Pisey, Toeur Veasna, Chhom Dinat, and the field staff in Kandal, Svay Rieng, and Prey Veng.

The numerous consultants, interns, and supporters for their hard work and dedication: PATH, HCD iLab, Whitten & Roy Partnership, 17 Triggers, and Genevieve Kelly.

The village, commune, district, and provincial authorities in Cambodia who have helped support the development of sanitation markets in their communities.

And finally to all the men and women entrepreneurs who have invested their time and money into producing, distributing, and promoting sanitation and latrines in rural Cambodia. You are the reason rural Cambodians are becoming healthier and more prosperous!

Abbreviations and Acronyms

BCC	Behavior Change Communications
CLTS	Community Led Total Sanitation
D&D	Decentralization and Deconcetration
DIW	District Integration Workshop
EOP	End-of-Project
HC	Health Center
HCD	Human Centered Design
iDE	International Development Enterprises
IDPoor	National poverty ranking system implemented by the Ministry of Planning
i-Lab	iDE's Innovation Lab
KDL	Kandal
LBO	Latrine Business Owner
M&E	Monitoring and Evaluation
MIS	Management Information System
MFI	Microfinance Institution
MRD	Ministry of Rural Development (Cambodia)
MSMEs	Mirco, Small, and Medium Enterprises
NCDD	National Committee for Sub-national and Democratic Development
PAT	Poverty assessment tool
SanMark	Sanitation Marketing
SanFin	Sanitation Financing
SMSU	Sanitation Marketing Scale-Up Program
ST	Sanitation Teacher (project title for sales agent)
SVR	Svay Rieng
USAID	United States Agency for International Development
WATSAN	Water and Sanitation
WSP	Water and Sanitation Program (World Bank)

All monetary values have been converted from Riels to USD at an exchange rate of 4,000 Riels=US$1, unless otherwise noted

1 Executive Summary

The Sanitation Marketing Scale-Up (SMSU) project was designed as a three-year project (August 1, 2011-October 31, 2014[1]) that built on the success of the Sanitation Marketing Pilot Project, both of which were implemented by iDE Cambodia. A sub-component of SMSU included the "Going Deep" project (July 2011-December 2013), which was technically supported by the Water and Sanitation Program (WSP) of the World Bank. The SMSU project was funded by the Bill & Melinda Gates Foundation and the Stone Family Foundation, both of which also provided supplementary funding to the Going Deep sub-component.

SMSU aimed to scale Sanitation Marketing on a national level in Cambodia across seven provinces, distilling principles, methods, and tools to support the replication of Sanitation Marketing globally. Going Deep activities were undertaken in the original Sanitation Marketing Pilot Project provinces of Kandal and Svay Rieng, serving as a "laboratory" for researching and designing new products, strategies, and approaches that would lead to greater market penetration and government engagement. Initiatives showing strong potential for success at scale would then be replicated across the five other SMSU provinces[2].

In this report, Going Deep generally refers to the entire provinces of Kandal and Svay Rieng. When noted, it also includes the efforts to engage Microfinance Institution (MFI)-connected Latrine Business Owners (LBOs) in Prey Veng province[3]. Scale-Up provinces refers to the other five SMSU provinces: Banteay Meanchey, Kampong Thom, Oddar Meanchey, Prey Veng, Siem Reap. SMSU, as a harmonized project, refers to all seven provinces, including the Going Deep provinces.

The original Sanitation Marketing pilot and SMSU have demonstrated that developing markets for sanitation (a.k.a. Sanitation Marketing) is able to contribute to significant increases in latrine coverage. 45% improved (pour-flush) latrine coverage was achieved in the seven project provinces, surpassing the satisfactory project target and a substantially increase from 29% at baseline in February 2012. This is a significant jump of 16% in coverage over a relatively short period of time (essentially 2.5 years from baseline to endline).

[1] A no-cost extension was granted to extend project end date of August 31, 2014 to October 31, 2014.

[2] Specifically, the Terms of Reference (TOR) for Going Deep (revised extension version) outlined two main objectives: "Go deep" by developing methods for engaging and supporting the government (national and local), the supply chain, and NGO actors to further the previous pilot work in Svay Rieng and Kandal provinces by encouraging large numbers of the population beyond the 'early adopters' through Behavior Change Communications (BCC) to purchase adequate latrines. Develop an adapted latrine option for use in challenging environments using the Human-Centered Design process, and test its market potential.

[3] No available MFI partner could be found in Svay Rieng, so the project decided to conduct the microfinance pilot with a partner available in the neighboring province of Prey Veng. Please see section 3.6.6 for more details.

The project also surpassed the topline "excellent" target with 141,131 latrines sold through project-connected business, with an average leverage ratio of 1:1. For every latrine sold by a project-connected business, another 1 latrine is sold by a non-project connected business.

Overall, there has been a doubling (12% increase) in IDPoor coverage since the baseline in early 2012. 22% of SMSU customers were classified as IDPoor. This equates to roughly 30,000 IDPoor sales to-date, well in excess of the satisfactory target of 10,400, but shy of the excellent target of 42,000. Analysis, however, shows that there are many places where the project could have better served the ID Poor market. Consistently across all project provinces except for Kandal, the project undersold to the ID Poor households, where the proportion of SMSU sales going to ID Poor is lower than the proportion of ID Poor households in the country.

Another area of improvement is in installation wherein installation rates are lagging behind sales rates. While there were no explicit SMSU targets for installation, this is a precursor to usage, which was an explicit SMSU target. As part of the verification protocol, the project has been checking on the installation of project-connected latrines within a 6-12 month window after sales. On the basis of this analysis, overall 62% of latrines have been installed by 6-12 months post-purchase. This also indicates that we expect a lag between increases in sales through SMSU and corresponding measured increases in coverage. Notably, the majority of the latrines that are installed are installed in the first month after purchase. The rate of cumulative latrines being installed starts to really diminish after about 3 months, which means that the project either needs to ensure that latrine purchases are followed up within the first 3 months after purchase or additional tactics are needed for uninstalled latrines that have been purchased more than three months prior because it is increasingly less likely that they will be installed.[4] Delays in installation reaffirm the need to remove barriers to immediate use, such as developing or packaging an affordable, desirable, and accessible shelter along with the installation service.

With the professionalization of sales, the project has seen an evolution from 'latrine business owner' (LBO[5]) driven sales to Sanitation Teacher (ST), i.e., sales agent-driven sales. LBOs have proven to be generally uninterested or incapable of effectively managing village level sales activities, necessitating a more active role by the project to support sales management to achieve the public health goals of rapid latrine uptake. Analyses of enterprise data show that active STs are strongly correlated with LBO performance and sustainability. LBOs with the highest monthly unit sales have the highest number of STs actively involved per month, while LBOs with lower sales tend to have very few or no active STs. However, high monthly sales units and high profit margins are not necessarily correlated with LBO sustainability, a large part because LBOs that take on subsidy fulfillment contracts may receive a one-time contract with above-market prices and then no longer sell latrines after the contract has finished.

[4] For each of the latrine curves shown in the section, only those installations containing a valid purchase date and installation date were used. This is the reason why there are minor discrepancies between the total percent of latrines installed in the previous sections, and where the curve maxes out in these figures.

[5] The term Latrine Business Owner (LBO) refers to the local enterprises that the project has engaged to produce and sell latrines. Usually, they are small to medium-sized existing businesses who already have experience producing concrete products.

90% of all active LBOs (those who have made a sale within the last 6 months) are turning a profit, with the average profit being 0.26 cents for every dollar of sale. Out of the total 329 LBOs engaged by the project, 75% have achieved breakeven, which bodes well for the latrine business in general. Breakeven, however, does not necessarily indicate continued active sales (again, likely due to the subsidy relationships of many LBOs).

Analysis indicates that sanitation financing played a significant role in increasing access for the poor, with more than two-fold increases in the coverage of the poor in Kandal and Prey Veng, two provinces that hosted sanitation financing pilots. In total, 37.8% of households used financing to purchase their latrine. Stratifying by IDPoor status, we see that 54% and 52% of IDPoor 1 and IDPoor 2 households used financing to purchase their latrine, respectively. But only 33% of non-IDPoor households used financing to purchase their latrine.

The project has also iterated on effective forms of market facilitation to drive rapid latrine uptake, as most prominently seen in the evolution and refinement of the direct sales model. Experiments with Direct Sales force Management (DSM)[6] show strong potential for significant increases in demand to be captured via direct sales. Local government involvement in Behavior Change Communications also shows promise in supporting effective demand creation.

The next iteration of the project, SMSU 2.0, seeks to address these topline results by continuing to improve on direct sales through organizational restructuring, while scaling up sanitation financing and developing shelters and installation services to improve installation and access to the poor.

1.1 Summary of Results

The success of SMSU was measured against the following indicators, agreed to by iDE, the Bill & Melinda Gates Foundation, and the Stone Family Foundation. For specific targets and achievements of the Going Deep project sub-component, please refer to the Going Deep End of Program report.

[6] iDE experimented with two projects that involved direct management of the sales team, where the sales staff were working on contract with iDE, and iDE had clear say how they managed their time. In both projects, the DSM approach showed that with greater project control, high close rates can be consistently reached, but challenges on the supply side existed and were, in fact, the bottlenecks.

Objec-tive	Key Milestones	Base-line		Period One	Period Two	Period Three	Grant End	
				10.01.11–09.30.12	*10.01.12–09.30.13*	*10.01.13–09.30.14*	*10.31.14*	
				Target at period end	**Target at period end**	**Target at period end**	**Cumulative target at grant end** (Satisfactory)	**Cumulative target at grant end** (Excellent)
1	70,000 latrines purchased from project-connected enterprises	N/A	Target at period end	14000	21000	35000	70,000	140000
			Achievement at period end	13,954	48,143	79,924		141,030
1	45,000 latrines purchased in target districts from enterprises not connected to the project		Target at period end	9000	13500	22500	45,000	N/A
			Achievement at period end	22,830	55,402	30,028	90,138	
1	41% total latrine coverage in target districts	29%	Target at period end	N/A	N/A	41%	41%	60%
			Achievement at period end	32%	37%	45%	45%	
1	30,000 latrines purchased outside of IDE target districts through the activities of organizations influenced by the project	N/A	Target at period end	N/A	N/A	30000	N/A	30,000
			Achievement at period end	0	0	52		52
1	10,500 latrines purchased by poor households from project-connected enterprises and/or through project-connected finance mechanisms	N/A	Target at period end	2100	3150	5250	10500	42,000
			Achievement at period end	2,819	10,208	17,165	30,191	30,191
1	In 50 out of 60 districts, 95% of adults consistently use their latrine at least six months after installation		Target at period end	83% of districts	83% of districts	83% of districts	N/A	95% consistent use in 50 out of 60 districts
			Achievement at period end	84%	Installation emerged to be the most important bottleneck and precursor of use, and thus, the project has started to track installation even though there are no targets around installation. By the end of Period Two, 58% of all latrines purchased were installed within a 6-9 month period. By the end of Period Three, 62% of latrines have been installed within 6-12 months of purchase. More details can be found in the SMSU Final HH survey report.			

1	90 enterprises profitably serving rural households with affordable sanitary latrines	N/A	Target at period end	30	30	30	90	N/A
			Achievement at period end	108	166	124	124[7]	
1	Sanitation Marketing working group formed and meets regularly	N/A	Target at period end	Group formed by Dec 2011	N/A	N/A	Group formed	N/A
			Achievement at period end	Formed Dec 2011	Meets regularly	Group meets when relevant	Completed	
2	30 paying participants trained in Sanitation Marketing program design and implementation	N/A	Target at period end	10	10	10	30	N/A
			Achievement at period end	11	25	0	36	
2	Sanitation Marketing programs designed in 4 countries	N/A	Target at period end	0	2	2	4	N/A
			Achievement at period end	2	2	0	4	
2	Sanitation Marketing programs launched in 2 countries	N/A	Target at period end	0	0	2	2	N/A
			Achievement at period end	3	1	0	4	
2	20,000 latrines purchased in other countries through Sanitation Marketing programs influenced by iDE	N/A	Target at period end				N/A	20,000
			Achievement at period end	240	4,206	7,893 (iDE programs) + 200,000 (SaTo Pan)	N/A	212,339
3	In-depth Research study design, timeframe, and budget finalized	N/A	Target at period end	Completed Jan 2012	N/A	N/A	Completed	N/A
			Achievement at period end	February 2012			Completed	
3	Based on metrics research, assess appropriateness of SMSU metrics and revise as necessary	N/A	Target at period end	Assessment in Sept 2012	Assessment in Sept 2013		Completed	N/A
			Achievement at period end	No revisions necessary	No revisions necessary			

[7] By the end of Period 3, 90% of active businesses were profitable. At this time, there were 138 Active LBOs (defined as having made a sale in the previous 6 months as of Oct. 2014)

2 Lessons Learned

SMSU produced important lessons on how to further stimulate both demand and supply for sanitation and engage the enabling environment to support rural sanitation. In this section, key lessons are summarized in the hope that they will inform the design, implementation, and cost-effectiveness of future sanitation marketing projects.

SUPPLY

2.1 Small and Micro Enterprises (SMEs) show low interest in actively selling; other models of market facilitation needed to ensure sustained impact

The Pilot Project (2008-11) demonstrated that local markets can be catalyzed to meet the sanitation needs and desires of the rural households. Households are willing to buy, and suppliers are willing to sell an aspirational, accessible, and affordable latrine. With facilitation support, enterprises learned the know-how to derive profit from selling latrines. The SMSU project continued where the Pilot Project left off—focusing on the Latrine Business Owner (LBO) as the main actor driving latrines sales in order to reach more market segments in the rural communities. The hypothesis was that the LBO, driven by the profit motive, would be interested and motivated to support active and direct sales. However, it is observed that, for a variety of reasons, the LBOs have limited capacity and/or motivation to manage active sales and promotions of latrines. In retrospect, the term "Latrine Business Owner" may have been a misnomer. Rather than an individual focused on latrines as a line of business, they are usually concrete producers who make concrete rings that happen to be used for the latrine product. Without a doubt, they are sustainable businesses in their own right—i.e., they will likely continue selling concrete products even if project activities were to end—but whether or not latrines will remain a significant line of business for them remains to be seen.

In response to this learning, the project's next iteration of market facilitation focused on directly recruiting and managing sales agents and coordinating with the LBO to match supply and demand. This model of market facilitation challenges the project's initial understanding of the role and meaning of sustainability—that the business will sustain a high level of demand creation efforts once project support is removed. Given that these enterprises show reluctance for active sales management, the level of latrine sales by LBOs would likely decrease if the project were to remove sales support immediately. The project's goal is to continue striving for sustainable impact, which may or may not be the same as a sustainable market. iDE maintains the option of evolving the model into a social enterprise model, which might become the most viable option to address market failures at the pace that would better meet public health priorities.

2.2 Professionalized sales and a standardized selling, training, and coaching process is critical for rapid uptake by households and replication across the project

In contrast to the novice sales process during the Pilot Project (2008-11), SMSU entailed a deliberate effort to professionalize sales, sales training, and sales management. With the support of Whitten & Roy Partnership (WRP), the project developed a sales training approach that included systematic sales training and sales management processes and a package of supporting tools, which were developed in collaboration with 17 Triggers. While the training materials and process were developed as a package, project staff are trained and coached on how to deliver personalized coaching based on individual needs of the LBOs and sales agents. From this experience, professionalization of sales is a crucial investment for sanitation market development efforts to ensure that the critical activity of selling is deliberate and based on industry best practices.

2.3 Low prices may not be the best for the consumer as it can undermine the sustainability of enterprise motivation

In the Pilot Project (2008-11), the project designed the enterprise training such that it recommended a minimal profit margin (~$5/latrine) to increase affordability for rural households. It was believed that enterprises would be motivated to sell latrines on a low-margin, high-volume model given the large market of potential customers. SMSU's experiences showed that enterprise motivation to sell on low margins are dependent not only on profit margin, but may also depend on the opportunity cost of other lines of business.

The project found that a low profit margin—$5/latrine for the LBO and $2/sales agent—is not sufficient for maintaining sustained engagement. The LBO and sales agent might continue to sell if they are experiencing a period of high sales. However, any period of low sales could deter them from reengaging due to the low profit.

LBOs and sales agents, like most rural Cambodian households and small businesses, have multiple streams of income, which they consider as part of their opportunity cost calculation. LBOs, despite the title of "latrine business owners," are ultimately just concrete producers who happen to make concrete components of a latrine and deliver the parts as a package. They make other concrete products and often have institutional contracts that are more lucrative than latrines. Thus, too low of a margin will not be sufficient to maintain their engagement to actively produce stock and promote latrines.

In the sanitation micro-finance pilots, LBOs were originally selected based on their overall capacity, e.g., capital, stock, delivery capacity. However, the project found that the most engaged LBOs were not necessarily the ones with the largest business. Rather, the highest selling LBOs were sometimes the smallest ones. It appeared that what mattered more in terms of LBO engagement in latrine sales had to do with the proportion latrine sales comprised of their overall business; i.e., an LBO with fewer other lines of businesses, or whose other lines of businesses were less profitable than latrines were more likely to be focused on selling latrines as the opportunity cost of doing so was not considered high.

In response, the project started advising LBOs to raise the price of latrines, which would contribute to a higher commission to sales agents. Some LBOs were reluctant as they felt that consumers were already familiar with the market price and thus would not be willing to pay higher prices. However, field

observations show that the prices have generally increased, with more LBOs selling close to the $40 in the southern provinces than the original $30-$35. Demand at the aggregate level, however, has not gone down, and project staff have not heard any customer complaints from LBOs or sales agents.

2.4 Leveraging existing supply chain actors is important for optimizing customer experience

In the Pilot Project (2008-11), the invention of the chamber box removed the need for a household to hire a mason, since the mason's specialized skills were no longer needed to construct a chamber box of brick and mortar. This was thought to benefit the end-user by allowing them to install the underground and slab portion of the latrine themselves for less cost, and that masons would ultimately benefit through increased demand for brick shelters. However, it was found that many households still prefer to hire the mason for the installation of the whole latrine since installation of the underground and slab is often done at the same time as installation of a brick shelter, which does still require a mason.

Moreover, bypassing the masons in the supply chain also led to some misconceptions about the chamber box quality. As the masons were unfamiliar with the new product innovation, either they would install it incorrectly, or tell the households to return it in exchange for the traditional bricks. That is, because the masons were still involved in the user experience, it was important to engage them so that even if they are not installing the product, they still serve as advocates. The case study of the masons shows that it may not necessarily be in the customer's best interest to bypass seemingly "unnecessary" supply chain actors. A closer analysis of their value added might reveal an opportunity to engage and leverage their presence.

2.5 Solutions to *challenging environments* require more than a modification or adaptation of the Easy Latrine design; otherwise heavy subsidy is required for uptake

The effort to design a latrine suitable for challenging environments (i.e., areas with high ground water tables or frequent flooding) produced two prototypes using an infiltration method. However, introducing the infiltration-based prototypes to market was not recommended as the research showed that infiltration is not realistically feasible, desirable, nor viable in the Cambodian context. Potential directions for future development were identified, including on-site waste treatment or sealed systems coupled with waste management.

One of the learnings from this experience was that a mere "adaptation" of existing pit-latrine designs is not sufficient for the challenging environments addressed. Rather, in order to develop a product that is hygienic, in light of known user behavior, investments into R&D for a new system—treatment or "sealed + waste treatment"—is necessary. Modification to current design is not sufficient for a market-based solution. Either significant subsidy is needed to encourage adoption of the proposed filtration design or a new archetype of latrine solution is needed.

DEMAND

2.6 Intensive "below-the-line" customer engagement is needed for effective promotions

Promotional efforts that lead to direct, significant impact on latrine sales need to have concentrated engagement with potential customers, such as a group sales event or door-to-door sales. Light-touch promotion initiatives that were tested such as health center engagement and religious leader engagement can add points of exposure, but unless invested in with intensive training and coaching, such channels do not directly target non-owners and address their individual needs and desires.

This is in line with the learning that other Base of the Pyramid (BoP) actors are observing on how "below the line" marketing is necessary for impact in rural village contexts, whereas "above the line" marketing is difficult to measure, often expensive, and is further removed from the end user. More discussion on this topic can be found in the report produced by Hystra, in which Hydrologic, a subsidiary of iDE, was one of 15 social enterprises featured. Please see the full report here.

2.7 Human-centered sales approach: sell to the problem, not on price or product.

In an effort to improve upon the sales efforts of the pilot, the current project uses the Human-Centered Sales™ approach developed by Whitten & Roy Partnership (WRP). The Human-Centered Sales approach helps sales agents focus on selling to a customer's problem, rather than selling on product features or price. Through a personalized conversation with the customer, the sales agent helps the customer identify all the problems he or she is encountering as a result of not having a latrine. Raising self-awareness about the problems of not owning a latrine intensifies the urgency and importance of resolving the problem(s) and helps the customer recognize the latrine as a viable solution to their problems. The sales agent is equipped with a "sight seller", a flip-book style sales presentation tool that highlights the common drivers of latrine uptake as learned through the user insights research.

The Human-Centered Sales approach increases the chances that the customer "buys in" to the latrine as a solution to their problems, rather making an impulse purchase due to fear mongering ("Your daughter will get raped if you don't have a latrine") or deception ("This is the last latrine available!"). If a customer has bought into the latrine as a solution, then they are likely to be more satisfied with the product and use the product properly and consistently, recommend their friends and family to buy, and be willing to pay a higher price, which will sustain LBO and sales agents motivation to sell.

2.8 Financing has significant impact on latrine uptake, but setting up sanitation financing is a hands-on effort that requires significant investments in field-level coordination and partner management

The IDinsight conducted randomized control trial research on Willingness-to-Pay with Financing showed that under certain operating conditions, financing has the potential to increase latrine uptake fourfold at a $50 market price and decrease operating costs by 70%. The research demonstrates that sanitation financing is a promising approach for increasing latrine uptake cost effectively. Project experience, in partnership with PATH, also indicated, however, that setting up partnerships with microfinance institutions is a long, iterative process that requires a lot of hands-on management.

Theoretically, developing the model for financing for sanitation (known in the sector as Sanitation Financing, or SanFin) is a one-time upfront cost, and the marginal costs will decrease when the model is scaled and replicated. However, even in Kandal working with a familiar partner—VisionFund, with whom iDE had previously developed an effective model for selling water filters on credit—the lessons learned from the previous experience were not immediately adopted by VisionFund in the SanFin pilot. Moreover, despite demonstrating the financial viability of latrine loans—the latrine loans were profitable and showed 100% repayment rates by the end of the pilot—both MFI partners still showed reluctance in integrating SanFin at scale after the pilot programs.

Three reasons are likely for this reluctance. First, MFIs are for-profit enterprises and latrine loans, though demonstrating profitability, are still less profitable than their other products because latrines are not income-generating assets. Thus, latrines loans and other social-impact loans have been restricted to a minority percentage of a MFI's total portfolio and are not considered a core part of the business.

Second, WASH financing is still a nascent field, and MFIs may be waiting for more proof of SanFin's positive business impact. The first successful partnership in Cambodia between an MFI and a WASH organization (Hydrologic) began only three years ago. At present, finding interested MFI partners is easier than three years ago, with MFIs voluntarily seeking to partner with development organizations on social loans. That is, financing products with positive social impact is becoming a more prominent consideration for MFIs, especially as they are looking to attract social investment funds, improve their public image, and compete for rural market share. However, it is too early to see MFIs making large institutional changes to accommodate the scale and speed of SanFin that the WASH sector is looking for.

Third, by the end of the SanFin pilot, both MFI partners expressed interest in scaling up SanFin. However, when presented the ambitious targets of SMSU, they expressed significant reservations. In discussions with the management it seems that capital is not an issue, as they have access to affordable capital from organizations like KIVA that have a focus on WASH. Rather, it is in part a function of their lack of capacity—e.g., insufficient human resources and limited MIS capacity—to reach scale as quickly as SMSU would require. Further support by the project would likely be needed to help the MFI achieve scale quickly.

Unclear commitment and limited capacity of the MFIs to do SanFin at scale begs the question of whether the efforts to engage them are indeed worth the cost-savings of SanFin that the WTP research demonstrated. Such challenges also beg the question of what other models are appropriate for providing financing to rural households that may avoid the need for external institutional partnerships. More learning and experimentation is necessary to better understand how to integrate financing in sanitation market development.

2.9 A lag remains between sales and installation

The SMSU Year 3 Household Survey shows that 62% of latrines have been installed by 6-12 months post-purchase. While the sales efforts have successfully gotten households to making the first step towards latrine usage, i.e. purchase, it is falling short of instilling a sense of urgency to immediately install and use the latrine. However, from the Pilot Project's End-of-Project evaluations, it is known that most households do end up installing their latrine eventually. At 450 days (15 months), installation rates are around 95% with a continuing upward trend. This indicates that the vast majority of latrines that are

purchased are installed, which is as expected since the latrine cost is a significant cash outlay for a rural household and is not likely to be abandoned. This is confirmed by the most recent SMSU household survey, which shows that abandonment is very low with only 0.2% of households visited having abandoned their latrines.

Despite the eventual installation, there still remains for the household many barriers preventing immediate installation and use. Noteworthy is the strong preference of Cambodian households to build a concrete shelter. Households will wait to install the latrine until they have all the materials and labor ready to install the entire concrete shelter. From a health perspective, it is the underground components that are important for public health, but from the household perspective, it is the superstructure that meets their needs for status and convenience. In order to decrease the gap between the sales and installation rates, a two-pronged approach would be recommended: 1) Remove the main barrier preventing households from immediate installation and use by developing a packaged shelter product that is easy to purchase, build, and use; 2) Improve behavior change communication interventions to stimulate a greater sense of urgency for the households to install and use.

ENABLING ENVIRONMENT

2.10 Proper training, ongoing coaching, and monitoring is important for successful local government engagement

Government engagement, like private sector engagement, needs to be supported with a holistic approach of ongoing training, coaching, monitoring, and relevant tools. Instrumental to the success of the Behavior Change Communications (BCC) campaign was the holistic but practical system of coaching and monitoring in conjunction with relevant and easy-to-use tools. Despite the many development issues that the Commune Committee for Women and Children (CCWC) are intended to conduct educational village meetings on, many CCWC facilitators cited the BCC campaign as the first time they have ever received coaching and tools on speaking about sanitation, or any topic for that matter. Notably, it was not just a one-time training but rather training supported with ongoing check-ins and feedback that helped the CCWC improve and gain confidence in engaging villagers. The ongoing training and feedback is important for helping the CCWCs learn by doing, and making improvements immediately upon real-time feedback, as opposed to waiting until the end of a project after the evaluation. This lesson is important, especially when considering conducting capacity building for the government at scale.

Moreover, local government officials often show enthusiasm for sanitation efforts. However, they only have limited resources and know-how. Further engagement and resourcing of government at all levels and across various ministries is necessary to further empower local government to actively support sanitation.

2.11 Engagement process of other ministries not consistent across provinces

As part of the effort to establish multiple touch points with households and catch them when they are most intensely experiencing the negative effects of not having a toilet (diarrhea), the project sought to partner with local health centers to do light-touch marketing, e.g., handing out fliers for latrines during consultation. However, the project discovered that without formal inter-ministerial agreements for collaboration at the national level, field level inter-institutional collaboration is difficult. The nature of

governance culture is very hierarchical—lower levels of staff are generally hesitant to pursue any activities that are not officially sanctioned by their superiors. These challenges were apparent in the project's effort to engage health centers, which are under the Ministry of Health. The MoH, given its role in setting health protocols, naturally has strict procedures of engagement. The project's efforts in engaging health centers yielded inconsistent results, with some health center staff being more open to informal relationships testing new promotional ideas than others. Without higher-level permissions, engagement of other ministerial institutions will be inconsistent across provinces and thus more difficult to scale in a standardized manner. Success in doing so will depend on the individual provinces' level of government support and engagement.

2.12 Grassroots efforts demonstrating impact may influence upstream policy

Successful field engagements of local government can influence policy change. The project found in the government engagement research that while CCWCs have a budget and mandate to spend on sanitation, institutional barriers prevent them from spending it on anything other than what is listed in the guidelines. For example, they could use their budget for meeting snacks, which is an explicit suggestion in the budget guidelines, but not for training materials, which does not. However, by the end of the BCC campaign, during the second peer exchange event, the CCWCs and the Commune Chiefs expressed interest in carrying forth the BCC campaign using funds from the Commune Council budget. It has yet to be seen whether there will be any institutional barriers to this. If this moves forward successfully, it would be an example of changing policy bottom-up through successful grassroots engagements.

3 Project Implementation

3.1 Project Background

The Sanitation Marketing Scale-Up project, which includes a sub-component, 'Going Deep,' builds on the Sanitation Marketing Pilot Project (2008-11).

Sanitation Marketing Pilot Project (2008-11)

Before the pilot project uptake of improved sanitary latrines by poor rural households in Cambodia was slow. Cambodia had achieved approximately 23% rural sanitation coverage (2008 census) towards the Millennium Development Goal (MDG) of 30% coverage by 2015. These were among the lowest rates of latrine coverage and the lowest targets for improved rural sanitation in the Southeast Asia region and globally.

Against the background of low coverage and slow progress, WSP commissioned iDE to conduct a supply and demand study of the sanitation market. The results indicated that there existed latent demand for latrines among households, and that individual households had purchased about 80% of the latrines that had already been installed in the country directly from private sector suppliers.[8] Clearly, private sector actors were already active in addressing the demand for latrines to some degree. At the same time, a history of well-meaning subsidies had depressed the demand for latrines, stymied the growth of private sanitation markets, and resulted in latrines that were often not used or maintained[9].

The 77% of the rural population that still needed a latrine represented a great market opportunity, but the mismatch between products and services offered by existing enterprises and the needs, wants, and desires of households resulted in a failure of the market to capitalize on this opportunity.

To address this situation, USAID/Cambodia Micro, Small, and Medium Enterprise Project (MSME) and WSP jointly funded the Sanitation Marketing Pilot Project. The pilot project was implemented by iDE Cambodia in three districts in Kandal province (Kandal Steung, S'ang, and Koh Thom) and three districts in Svay Rieng province (Svay Chrum, Rumdoul, and Romeas Heak).

The Pilot Project aimed to improve the affordability, accessibility, and attractiveness of latrine options available to rural households through the market; to build household demand for latrine purchases through social marketing; and to demonstrate to private enterprises that they could profit from creating demand for and supplying sanitation products and services to rural households. The 30-month pilot

8 Salter D, et al., 2008. Sanitation Demand and Supply in Cambodia: Field Note. Washington, Water and Sanitation Program, World Bank.

9 These ideas are alluded to on page 22 of WSP's field note, "Sanitation Supply and Demand in Cambodia" and on page 13 of WSSCC's report "Public Funding for Sanitation: The many faces of sanitation subsidies".

project consisted of 12 months of R&D for latrine product design (Jan-Dec 2009), 16 months of implementation (Jan 2010-Apr 2011), and two months for reporting (May-Jun 2011).

Using Human-Centered Design (HCD)—an approach that develops a deep understanding of the user and the supply chain as the basis for developing, prototyping, testing, and refining design options—the a latrine product was developed for Cambodia's market. The result was a US$35 pour-flush latrine that was branded as the "Easy Latrine." Designed to be produced and sold by local enterprises, the basic Easy Latrine kit includes three concrete rings, a pit lid, a collection chamber, a slab with integrated ceramic pan, a PVC drain pipe, a bag of mortar to seal the drain pipe joints, and illustrated installation instructions. A shelter (not part of the kit) can be constructed of simple thatch or more expensive materials depending on the owner's budget. The Easy Latrine can be self-installed and responds to the needs of rural households by being aspirational (pour flush, offset pit), accessible (home delivery, packaged product), and affordable.

The innovativeness of the Easy Latrine rests in the fact that it stimulated both the supply and demand sides of the market—customers wanted to buy, and businesses wanted to sell. The pilot resulted in a total of 10,621 Easy Latrines sold without subsidy by project partner enterprises and non-project partner enterprises; and for every East Latrine sold, another 1.12 other latrines were sold.

Going Deep sub-component of SMSU

These figures proved that a market-based model could accelerate latrine uptake. However, over 70% of the rural Cambodian population still remained without access to improved sanitary latrines. In order to go beyond the "early adopters," improved market strategies and product adaptations for use in challenging environments were needed. Moreover, local and national government needed to be engaged in order to align project objectives with the national development priorities and to encourage deeper understanding and ownership of the sanitation marketing approach and its potential application across Cambodia.

The framework that grounded the concept for SMSU, including the Going Deep project, was the "technology adoption lifecycle[10]." In this model, the sequence of customer types to adopt a new product is: innovators, early adopters, early majority, late majority, and laggards. Latrine coverage is an indicator of where in the product adoption curve a given region lies. In Kandal, with over 50% latrine coverage, the province sits between the end of the "early majority" and moving into the "late majority." In Svay Rieng, with approximately 34% coverage, the province sits between the "early adopters" and "early majority." Across the total seven SMSU provinces, iDE's 2012 baseline survey indicates that the mean coverage was 32%, and lower when Kandal and Svay Rieng are removed from the analysis, placing the non-Going Deep provinces in the early adopters category.

[10] The technology adoption lifecycle is usually illustrated as a classical normal distribution curve (or the bell curve). Thus, the various groups map onto the following levels of market saturation: Innovators: 2.5%, Early Adopters: 13.5%, Early Majority: 34%, Late Majority: 34%, Laggards: 16%

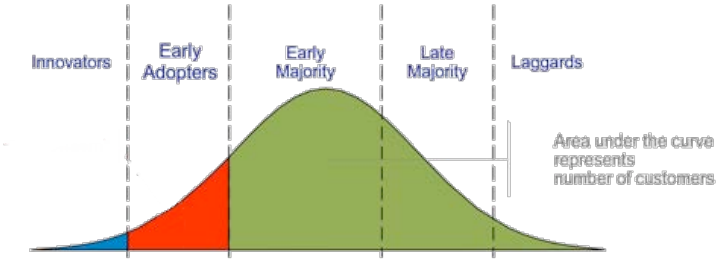


Figure 1: Technology Adoption Lifecycle

It was envisioned that the different customer types could be addressed through successive "sweeps":

- **Sweep 1.** Make appropriate latrine options available for rural households to purchase from local suppliers by i) building the capacity of local entrepreneurs to profitably manufacture, promote, and distribute latrines and ii) stimulating demand through social marketing campaigns and sales. During the pilot project, effective Sweep 1 strategies were developed and tested in Kandal and Svay Rieng provinces to capture primarily the "early adopter" and some of the "early majority" segment of the market, i.e., households that had enough available cash and were willing to risk investing in a relatively new and unfamiliar product.
- **Sweep 2.** Increase latrine sales and market penetration reaching the early and late majority households, including poorer households, through targeted marketing, professionalized sales, product innovations, and the use of sanitation financing. This next wave of purchasers includes households that have less cash on hand and/or a greater need to see their neighbors using a product before they are willing to invest themselves.
- **Sweep 3**. Target the remaining "late majority" and "laggard" households without latrines (presumed to include the poorest households) through partial subsidies delivered in ways that minimize the negative impact on sanitation markets such as voucher systems and conditional cash transfers.

This approach supports the MRD's stated desire to pursue strategies that develop sustainable markets first and provide direct hardware subsidies only as a last resort[11]. Going Deep mainly played the role of Sweep 2, as the rest of SMSU experienced Sweep 1 and adopted successful innovations from Going Deep. Sweep 3 concept was not addressed in Going Deep.

[11] On page 15 of the National Strategy for Rural Water Supply and Sanitation (2011-2015), it states: "For sanitation, public finance should mainly be used to stimulate demand and develop the enabling environment (including affordable products) so that households pay for their own toilets. Those who can pay should pay. While targeted hardware subsidies may be provided to poor households to buy toilets, and to reach the vision of 100% coverage, direct hardware subsidies should be used with caution and only as a last option, and alternative mechanisms should be prioritized."

3.2 Study Sites and Regional Differences

According to the theory of the sweeps, Kandal and Svay Rieng had been undergoing the first sweep in the Pilot Project. The goal of Going Deep was therefore to explore how Sweep 2 efforts could increase market penetration, which is why Kandal and Svay Rieng were selected for Going Deep interventions. Concurrently, the other five provinces of SMSU experienced Sweep 1; with the intention of scaling successful Sweep 2 interventions from Going Deep to the rest of SMSU.

As in the pilot, the two target provinces are in distinctly different regions of the country and their environmental, political, and demographic differences provided opportunities for learning.

- Kandal province surrounds the country's capital city of Phnom Penh. The province is relatively urban, characterized by higher population density, good access to markets, good water resources, favorable road conditions, multiple income earners in one household, greater density of economic establishments by household[12], and baseline latrine coverage of 49.3% at the beginning of Going Deep.[13]
- Svay Rieng is a rural province situated in the southeast of Cambodia along the Vietnamese border. It is one of the poorest provinces[14] with low population density, poor market access and unfavorable road conditions. A large majority of the population are subsistence farmers. The baseline latrine coverage at the beginning of Going Deep was 27.7%.
- According to the SMSU Baseline survey, with the exception of Banteay Meanchey, which is one percentage point higher in coverage than Svay Rieng, the non-Going Deep provinces all had lower coverage than Kandal and Svay Rieng. Moreover, a significant number of provinces has a large subsidy presence, including Banteay Meanchey, Siem Reap, Oddar Meanchey, and Kampong Thom all with 30% of latrines that were subsidied.

The notable regional differences described above have two implications.

First, the Pilot Project results disproved the original hypothesis that Kandal would have greater latrine sales and sanitation market development than Svay Rieng, given the greater discretionary income, access to markets, and population density. In Going Deep, Svay Rieng and other more rural provinces like Prey Veng continued to show greater sales and increases in coverage than Kandal. One hypothesis explaining this effect is that the marginal difficulty of reaching the next customer becomes greater as market penetration increases. It remains to be seen whether provinces like Svay Rieng and Prey Veng will show a plateau or slow-down once a certain level of market penetration is reached. It also remains

[12] Table 4-1 of the "Preliminary Results of the Cambodia Inter-censal Economic Survey" by the Ministry of Planning in 2014. http://www.nis.gov.kh/index.php/en/find-statistic/publications/reports/cies2014.html

[13] The baseline latrine coverage quoted here for Kandal and below for Svay Rieng are taking background projections from the SMSU baseline study (village-level questionnaire data) conducted in January 2012.

[14] While the Cambodian government does not measure GDP by province, there have been studies looking at the number enterprises and amount of annual sales by province. One can find these figures on pages 43-47 of the "Economic Census of Cambodia 2011" in the Kampong Cham provincial report. www.stat.go.jp/info/meetings/cambodia/pdf/ec_pr03.pdf

to be seen whether there exists a "critical mass" at which coverage of the majority leads to a "tipping point" effect of rapid increases in coverage due to social norms, for example.

Second, the effect of subsidy has had a significant negative impact on the viability of the market-based approach. Selling was significantly more challenging in the northern provinces of Banteay Meanchey, Siem Reap, and Kampong Thom, sales agents were routinely encountering households with unused latrine parts sitting in their compound; surrounding households were also unwilling to make an investment to purchase their own latrines when rumors of further subsidy to come continued to infiltrate the villages.

3.3 Formative Research: Going Deep

In order to understand how to achieve the maximum market penetration potential, three main research initiatives were launched in the beginning of SMSU as part of the Going Deep project. Of the many questions that emerged by the end of the Pilot Project, four critical ones stood out: 1) How should the market be segmented to better create demand among the remaining majority of early and later adopters? 2) Should the project continue branding the latrine as the Easy Latrine? 3) How might the project engage local and national government to support and promote market-friendly approaches to sanitation? 3) How can sales be improved to drive rapid uptake of household latrines?

3.3.1 Market Segmentation Research

In order to go beyond the "early adopters" of the Pilot Project, more research was needed better understand the drivers and barriers of various market segments. The project conducted a month-long HCD research process at the beginning of Going Deep to confirm known and unearth new insights that would ground efforts to more deeply penetrate the market. User insights research was conducted to deeply understand the needs and psychology of latrine users and non-users. Over 40 in-depth interviews were conducted with user and non-user households and members of the supply chain. The research findings informed five frameworks for better understanding the user and their latrine purchasing process. For more information, please see the full report.

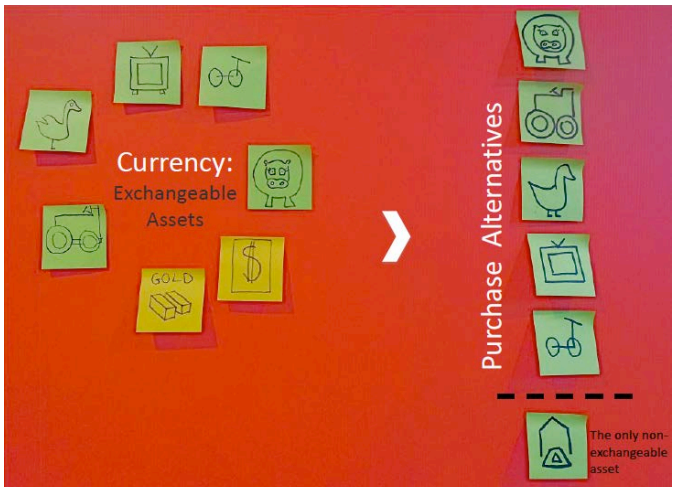


Figure 2: The exchangeability of the latrine relative to other assets

Households value ownership of tangible things, especially things that can serve as an investment and generate more income, e.g. animals, gold, rice mill. Households also like to own things they enjoy, e.g. TVs and karaoke systems. Both types of products generate a positive return. The latrine has not been a purchase priority because it does not satisfy the need to generate positive returns, neither financially nor emotionally. Most households own latrines to save face, which moves them from a negative state of embarrassment and shame to a neutral state of not being embarrassed or ashamed.

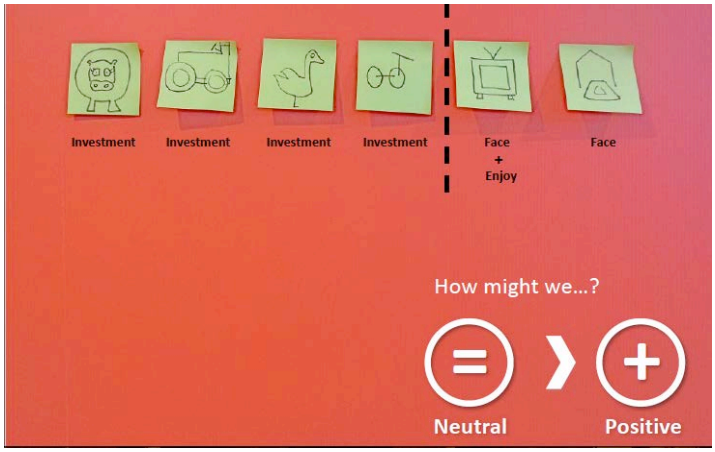


Figure 3: Positioning the latrine to generate a positive return, either financially or socially

Households' openness to purchasing a latrine can be understood against three categories: i) their attitude towards money ii) the child-parent relationship and iii) the physical location of their defecation spot. Households who perceive themselves to be extremely poor, who take care of young children, and who have access to a toilet nearby are the least likely to purchase a toilet. Households who perceive themselves to be able to afford a toilet, who have elderly parents, and who only have access to crowded areas without bush are the most likely to purchase. Purchase intents are seen to emerge from

households who recognize that they have a problem, e.g. embarrassment and/or a desire, e.g. to match neighbors.

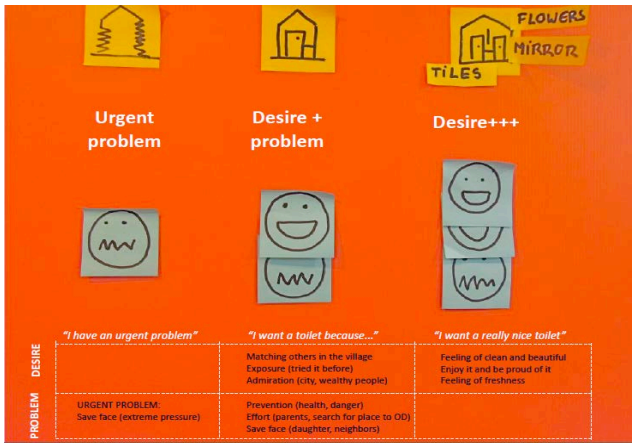


Figure 4: Mapping drivers of uptake to product categories

Households' impetus for buying a latrine dictates the kind of latrine and shelter they purchase. Those who are looking to satisfy an urgent problem, e.g. intense social pressure will often build a cheap natural shelter. Those who are looking to solve a problem *and* to satisfy an aspirational desire will likely purchase a concrete shelter. Those who are looking to satisfy higher-level aspirations such as aesthetics and enjoyment will likely investment in a bathroom with the works—tiles, mirror, large water basin, and flowers.

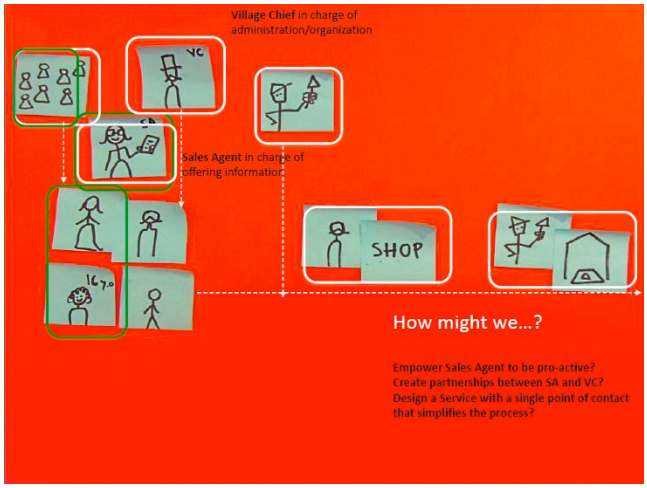


Figure 5: Household latrine purchase experience

The research findings mapped the household latrine purchase process for both Easy and non-Easy Latrines. The mapping showed that despite innovations in the pilot, the latrine purchase process remains complex and leaves room to be simplified even further. Households must deal with different actors at each step of the process and do not have easy access to accurate and precise information

about product options and prices. Moreover, supply chain actors such as the sales agents, village chiefs, and masons are not being leveraged fully to drive households to purchase.

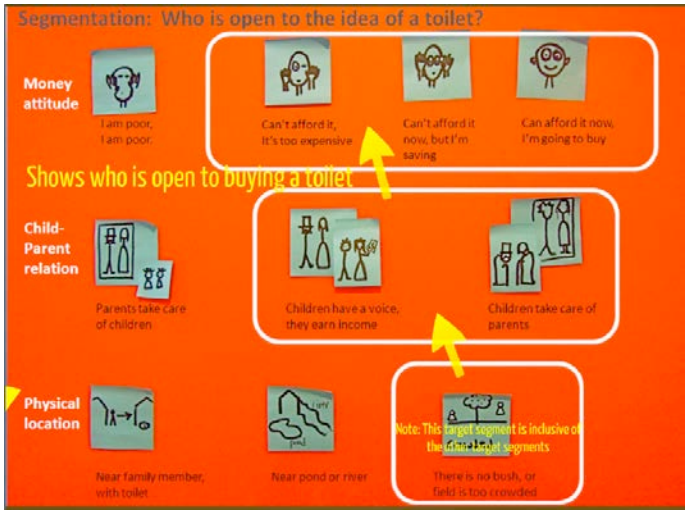


Figure 6: Psychographic market segmentation of non-latrine owners

The User Insights research findings about those open to buy were then reframed into the transtheoretical model of behavior change, which assesses an individual's readiness to act on a new healthier behavior, and provides strategies, or processes of change to guide the individual through the stages of change to from Pre-Contemplation (not even considering the change), to Contemplation (starting to consider the change), to Preparation (getting ready to make the change), to Execution (acting), and finally to Maintenance of new behavior (consistently acting according to the new behavior). Mapping the influencers, barriers, and accelerators onto the various stages of behavior change allowed the project to then design interventions to address the specific needs of each stage. The User Insights and Market Segmentation research informed the sales, marketing, and enterprise engagement strategy, which is discussed in greater detail below. Please see Table 1 for the transtheoretical model of change.

Transtheoretical Model of Change						
Behavior Change Stage	**Pre-Contemplation -->**	**Contemplation -->**		**Preparation -->**	**Execution -->**	**Maintenance**
Cash Attitude	Not even thinking about it	"Can't afford/Too expensive"		Researching/saving	Ready to pay in cash or on credit	Regular investment
Influencers		Personal, Family, Societal Attitudes			*Personal/Family/Societal Attitudes Determine what kind of toilet and what level of maintenance*	
		Personal	**Family**	**Societal**		
		Privacy	*Toilet is practical - it serves many purposes*	*Convince my parents: I don't want my friends to think less of me*		
		Desire for spacious toilet	*Clean toilet = Clean House = Clean Family*	*Build the best possible one: Build it once and only once*		
			Parents are important	*Show off*		
			My daughter's shame is my shame	*Festivals and Events*		
Accelerators	"That's better than mine"		Subsidy	Credit option: customer has credibility with LB; LB offers credit		Holidays, Visitors
				Customers feel they're getting the right price	Limited-time offers	
	Competing Purchase Priorities					
Barriers	Intangible idea of toilet: not sure what the costs and options are, for toilet and shelter				Flooding	
		Lack of Savings Plan			Incorrect installation	
		"I believe I can't afford it"				
	Lack of recognition of problem/desire					
	Lack of personal/family/social influencers			Anxiety about paying back large debts		
				Unclear about who and how to build a toilet		
				Many points of contact		
				Need to negotiate prices		
				Transportation difficulty		
				Don't know how to install		
				Emergency expenses, ex. Sickness		

Table 1: Transtheoretical Model of Change mapping out influencers, barriers, and accelerators for those "open to purchasing a latrine"

3.3.2 Product Branding

The end of program evaluations of the Pilot Project showed limited brand recognition by consumers of the Easy Latrine, which posed a question about the relative value of continuing to invest in brand development. To answer the question, the project conducted in-depth interviews with latrine business owners. Latrine businesses also reported low awareness of the Easy Latrine brand by villagers, but expressed strong affinity for the tagline, "Easy to buy, Easy to build, Easy to use".

The Easy Latrine name also did not seem to make a difference in convincing LBOs to participate in training. Rather, they were attracted by word of mouth about the training components such as manufacturing and sales.

Other possibilities were explored, but given the high costs of effectively developing a brand and enforcing quality control, and equally important, the lack of sustainability without continued outside support for brand management, branding was discontinued in at the beginning of Going Deep field implementation.

From a sector and global communications perspective, however, the Easy Latrine brand is successfully serving its purpose of conveying an abstract concept succinctly, and will thus remain in use in such capacity until otherwise decided.

3.3.3 Government engagement research

In order to answer the question of how to actively engage local government to support market-friendly approaches to sanitation, three questions needed to be answered first:

- What are the basic structures of government offices relevant to sanitation, identified to be principally the Ministry of Rural Development (MRD), Ministry of Interior (MoI), and the Ministry of Health (MoH)?
- What are the processes and timelines for setting priorities and budgets for the above ministries?
- Understand current government practices with which sanitation marketing can integrate and leverage, and identify gaps that that can be supported by "Going Deep," with a particular focus on developing government capacity to sustainably support the market without long-term external support.

To answer these questions, literature review and several interviews with secondary sources were conducted, after which over 20 in-depth interviews were conducted with government officials from all levels of government in the Ministries of Rural Department, Health, and Interior. Monks and village "elderly" were also interviewed to explore other potential supporters of market-friendly sanitation approaches.

The research findings mapped out the organization structure, roles and responsibilities, processes, and budget considerations of various government bodies relevant to rural sanitation market development. The research showed:

1. Sanitation promotion in Cambodia has rightfully focused on the Ministry of Rural Development as it is the government body specifically delegated to the issue. Specifically, the Provincial Department of Rural Development (PDRD) serves as an important stakeholder because although without a budget for programming of its own, PDRD receives funding from both MRD and development partners (mainly

UNICEF) and manages project implementation of subordinate offices. PDRD also has the capacity to coordinate various NGO, government, and business activities. Throughout Going Deep, the project advocated for consistent sectoral coordination meetings led by PDRD Kandal and Svay Rieng, with mixed success.

2. The research found that the District Office of Rural Development (DoRD), on the other hand, has much lower capacity. Without any budget of its own or authority to approve investment plans or budgets, DoRD acts more as a coordinator and adviser. Nevertheless, it is valuable to regularly communicate with PDRD and DoRD both about the project's activities to coordinate complementary market-friendly approaches to sanitation. At time of research and writing, Cambodia is undergoing a Decentralization and Deconcentration process, which is in the process of providing budget to the district level government offices for programming. Such a budget could change DoRD's capacity to be more engaged.

3. Commune councils emerged definitively as an important local government body to engage. As the most basic administrative unit of local Cambodian government, commune councils are primarily responsible for formulating 5-year, 3-year, and annual development plans. At the time of the research, commune councils are the only subnational government body with its own budget and thus can potentially be influenced to invest more in sanitation promotion.

4. The research showed, however, that commune councils rarely-to-never set aside budget for sanitation. The budget is spent mostly on infrastructure projects such as agricultural dams and roads. The only budget set aside for sanitation on the commune level comes from earmarked funds on social development, which the Commune Committees for Women and Children (CCWC) generally use for awareness and early education programs.

The focus on infrastructure projects seems to be driven by politics and existing NGO resources for sanitation. Large infrastructure projects are tangible, visible achievements councilors can show off to constituents. Large infrastructure projects are also more easily seen as public goods. Sanitation, on the other hand, has explicitly been called a private good "because each household must purchase their own latrine."

Interestingly, it is actually the relative effectiveness of certain government processes that have hindered sanitation from becoming more of a priority. Commune Councils meet with development stakeholders yearly at the District Integration Workshop, a forum held to share development plans and revise commune investment plans accordingly. The presence of existing government programs seems to delay urgency in addressing sanitation using the commune's own resources.

1. Even when considering using budget for sanitation, CCs and CCWCs think almost exclusively of providing hardware subsidies to households. Because the budget is not enough to provide all households with latrine subsidies, it is rarely pursued. However, roads and dams are still prioritized even though not all villages can receive new roads and dams each year. Villagers seem more willing to wait their turn for roads and dams than latrines. This seems to be due to the fact that roads and dams are seen as supportive of income generation, whereas latrines are for health, which villagers do not perceive to be directly linked with income generation. Again, roads and dams are also seen to be more "public" than latrines, even if not all villagers can benefit immediately. By the end of the BCC Campaign, however, there were encouraging signs that CCWC members were interested in exploring ways to use their budget for continuation of BCC activities.

2. CCWCs hold great potential for sanitation promotion, not just because they are the ones who most often manage budgets relevant to sanitation. CCWCs also serve as a node for connecting with other relevant ministries such as the Ministry of Health. Their membership being comprised of various institutions in the village, including the police and school, they are aware of village conditions and issues. Furthermore, as a group focused on women's and children's issues, sanitation naturally concurs with their interests. In designing the BCC campaign, the CCWCs were selected as the chosen facilitators for these reasons among others.

3. The government offices of the Ministry of Interior also can play valuable roles in coordination and advocacy. The MRD subnational offices of PDRD and DoRD must also report to their respective governors under MoI. The governors can advise and support but do not have the authority to mandate any programs to MRD offices.

   As an administrative manager of all line department activities, the governors can help coordinate with other line ministries. Moreover, as commune councils are part of the Ministry of Interior line, they report to the governors. The provincial governor approves commune council development and investment plans. At the time of the research, the district governor, like the district level in PDRD, has neither a budget of its own nor approval authority. He serves as an adviser and coordinator.

4. There exists ancillary bodies in MoI such as the Provincial and District Development Committees and Provincial and District Councils that host monthly meetings reviewing project progress and sharing updates. The project explored leveraging these existent meetings to further advocate for market-friendly approaches to sanitation. The meetings generally focused very little on sanitation, except for those run by the WCCC or DCWC, which was likely due to the fact that they were formally engaged under an MOU within the BCC campaign.

5. Engagement with the health centers under the Ministry of Health can potentially serve as a good complement to the project's engagement with MRD offices. Health centers catch people when they are most immediately experiencing the painful effects of poor sanitation. Health center staff members also hold positions of expertise and authority, which can make them effective influencers. Health centers also have their own network of health volunteers, most often village leaders. The project explored collaboration with the health centers through social marketing efforts to generate greater demand, but found that enthusiasm for collaboration was inconsistent. Health center staff often expressed that they needed permission from their superiors, which requires a more formalized partnership at the Ministry level.

6. Village elderly and monks both emerge as promising sanitation promoters. Both groups hold positions of respect and authority in the community. Both groups are also naturally seen as teachers. They have potential to be good sanitation social marketers and/or latrine sales agents. As such, the project experimented with targeting village elderly and monks as latrine promoters. However, the new sales strategy called for more dedicated sales agents who are able to sell outside their immediate geography, which is difficult for both the elderly and the monks, who are very busy and cannot travel too far from their immediate areas.

These learnings informed the opportunities for the project to better engage government in sanitation market-development efforts. Details of the government engagement initiatives are described under section 3.5.1 and 3.7 of this report.

3.3.4 External sales assessment

Although the pilot exceeded the project target of 10,000 latrine sales, it was clear that the sales capacity remained low. In order to answer the question of how to improve sales, the project hired Whitten & Roy Partnership (WRP), a sales management consulting firm to improve the sales model and practices. Below is a summary of findings and recommendations. Five major challenges were found with the existing model and practices used during the pilot phase:

1. Field staff lack adequate methods and know-how to train and mentor businesses without creating dependency.
2. The 3-month limit for training businesses is too short to adequately train businesses to be successful and independent.
3. Group and direct sales are not being coordinated and managed effectively to leverage benefits of both.
4. The absence of granular sales data limits ability to understand sales problems and respond adequately.
5. Sales agents use high-pressure, aggressive sales tactics that may sour the business reputation and create additional consumer resistance.

The following five solutions were recommended by WRP to address the challenges:

- A transformational training course for sales agents, latrine businesses, and the project management team to learn effective sales and sales management strategies and tactics.
- Design a clear exit strategy and a training course with a flexible deadline according to the needs and progress of each business. WRP envisions a window of 4-6 months with a significant scaling back of support at the end of the second to third month.
- Devise and approve a standard complementary strategy for selling that will make the most of group and direct sales approaches.
- Help businesses realize the value of data collection and devise a simple collection process.
- Design an experiential event to help sales staff realize the importance of treating customers with respect and honest and have them invent more sustainable, positive sales tactics.

With WRP's continued support, the project professionalized sales and sales management, sales tools, and devised deliberate ways to increase market penetration. While the need for professionalization was expected, the enormity of the scope of revising sales strategy and related operations was unexpected and not included in the original project scope and budget. However, once the research had shown how ineffective current practices were, and moreover, how big the potential for impact an improved sales strategy and operations could make, the urgent need to thoroughly revise sales and fully integrate it into the rest of the program was unquestionable.

Therefore, it was decided that sales revisions would not only be applied immediately in the Going Deep target areas of Kandal and Svay Rieng, but in all seven provinces across SMSU overall.

The project decision to fully integrate sales revisions across all seven provinces because of the belief that a strong sales network across the country is integral to creating an enterprise engagement model that can sustainably achieve high sales. Project results have validated the decision to front-load the investment into the professionalization of sales.

The project has also seen an evolution of sales strategy from one where the focal point of engagement was the LBO, to one that now focuses on the sales agents themselves. This evolution will be discussed more in section 3.4.2 of this report.

3.4 Supply side engagement

3.4.1 Professionalization of sales

3.4.1.1 Professionalizing sales tools

As part of the effort to professionalize sales, the project engaged 17Triggers, a social marketing agency, to work collaboratively with WRP to develop effective sales tools. The sales tools and sales agent training materials incorporated many elements from the National Stop the Diarrhea campaign, maintaining the same tone and style in an effort to maintain consistency. The National Stop the Diarrhea campaign is an open-source social marketing campaign that was developed under the guidance of the Cambodian Ministry of Rural Development by the WaterSHED and Lien Aid WASH Marketing Program with 17 Triggers.

> The messaging used in the sales materials were informed by the insights of the market segmentation research and follow the "CLEAR" sales framework (see under Sales support tools below). In testing the sales tools, villagers without prompting started calling the sales agents "Sanitation Teachers," which is the title the project has started using for sales agents. The sales tools included:

- Sales Training video and manual that covers the sales process from beginning (setting up territory) to end (moving on to a new village)
    - How to do a group presentation
    - How to do individual sales
- Sales support tools:
    - Village maps that can be used to draw and map the village so that Sanitation Teachers—the title given to sales agents—can keep track of whom they've spoken to
    - Group meeting invitations that can be passed out by the Sanitation Teachers to help bring people to the group meetings.
    - Sales order form that also includes referrals and testimonials to leverage the power of peer influence
    - Sight seller – The sight seller is a flip chart visual tool that helps the sales agent stay on track with the sales pitch. It follows that CLEAR sales methodology that WRP has developed:

        1. **C**onnect with the customer,
        2. **L**earn from the customer about their problems,
        3. **E**ducate the customer about the solution,
        4. **A**sk the customer for the sale, and
        5. **R**esolve any buying problems.

The sight seller is designed to "sell to the problem"—to get the listener to recognize their problems associated with not having a latrine (ex. embarrassment, inconvenience, fear) and realize that purchasing a latrine would help them solve those problems. This differs from the way sales agents often sell—speaking about the product specifications without relating to the experience of the customer.

- Goal setting and review of results
- Training completion certificate
- Sales record book to help LBOs and sales agents keep track of orders and deliveries

3.4.1.2 Improved sales strategy

Recruitment of a more dedicated sales force

At the end of the Pilot Project, the sales strategy focused on recruiting village leaders such as village chiefs to serve as sales agents, the rationale being that they were natural leaders with influence. While some village leaders were indeed effective sales agents, there was a lack of consistency, and often they were much less motivated to sell outside their village, which meant that it would pose challenges to scale such a model. Thus, the project focused on recruiting against a specific profile as opposed to those in a particular position. Recruitment of sales agents thus focused on those who demonstrate persuasive public speaking skills, ability to work at least half time and travel beyond their own village, empathic ways of relating to customers, and an ability to stay motivated despite the fluctuating nature of sales. The revised recruitment strategy did not preclude any local government officials from becoming sales agents, but recruitment no longer targeted them.

Experience throughout SMSU showed that often the most successful and dedicated sales agents were young, university-aged women who have dropped out of school. Their young age means that they often have more energy than the older village leaders, some even staying overnight in a village to capture higher sales on the weekends. As women they can easily relate to the females of the households. To recruit more similar-minded sales agents, the project recruited at universities and through the social networks of existing sales agents.

Direct sales: integrating group and door-to-door presentations

In the pilot project, sales agents exclusively sold to groups. Sales agents saw this as more efficient—getting more customers for less effort. However, as WRP pointed out, an exclusive practice of group sales leads to "burning turf"—exhausting geographic territory; sales agents would hold one to two group meetings per village, and then never go back because it became much harder to sell to villagers after already holding two meetings. Burning turf meant that it was much harder to "go deep," to ensure that the maximum number of villagers were reached. In order to penetrate more deeply into each village, sales agents were trained to closely coordinate their group and door-to-door sales presentations:

- Before the presentations, sales agents are encouraged to map out the village with the help of the village chief to identify all households without a toilet. The ST divides the village into sections of about 30 households to ensure that there is a good-sized but manageable attendance. The ST sometimes asks the village chiefs to help mobilize and encourage people to attend the meeting. Sometimes the sales agents pay a commission with the village chief for his or her efforts in mobilizing participants.

- Then the ST will go door-to-door to hand out invitations to households inviting them to join the group presentation, using this first impression opportunity to pique their interest about sanitation and latrines.
- The next day, the ST then hosts the first of the group meetings and continues to host group presentations until he or she has exhausted all the sections. All the while, the ST is keeping track on the map of households who have attended and bought. These names are recorded to use later as referrals and testimonials.
- For those who did not attend or who did not buy, the ST is encouraged then to visit them door-to-door, giving a one-on-one presentation with the family. The ST refers to all the neighbors who have already bought to trigger villagers' desire to emulate their neighbors.

Initially, the sales agents who were used to only doing group sales were reluctant to do door-to-door selling as they saw this as inefficient. However, many soon learned that door-to-door sales could actually yield more sales as it is easier to speak one-on-one with households than in a large group, which can be hijacked by one vocal skeptic. However, the project has seen that sales agents do tend to outsource the mapping and door-to-door invitation process to the village chief.

Deposits beneficial in securing sales and closing the orders vs. deliveries gap

In the beginning of SMSU, customers would often place an order, but request the sales agents to come back several months later after harvest to deliver and pick up payment. Such requests made it very difficult for the LBO to manage stock production and commission for sales agents. In an effort to more accurately and precisely manage stock and commissions, the project has encouraged all LBOs to request deposits of $2.50-$10 from customers, which has really helped in closing the order to delivery gap.

- Deposits both solidify a sale (make it more likely that the customer will come through and pay upon delivery day) and motivate sales agents to hold more meetings (since collecting deposits means they get paid their commission immediately).
- Most sales agents across SMSU have normalized a basic deposit system: following a sanitation meeting, the Village Chief writes down the names of customers who want to buy a latrine, using a Group Order Form instead of individual order forms.
    - The Village Chief signs every one up and also informs customers that they need to pay a $2.50 USD (minimum) deposit on the spot. It seems to be working very well to have the Village Chief introduce this deposit payment to villagers.
    - Villagers then go home to get their down payment, and the village chief collects it and gives it to the ST.
- Sales agents are generally paid $2.50 USD per latrine delivered by the LBOs, although some LBOs have agreed to increase commission to increase motivation of the sales agents.
- Deposits are really helping to keep sales agents motivated because the deposits allow for instant payment of their commission immediately following a meeting. If the customer cancels the order, the ST still keeps the deposit money (the Village Chief explains this when customers order), so this motivates sales agents to keep selling – they do not have to wait for delayed deliveries or payments. Sales agents, of their own volition, pay the Village Chief 3,000 Riel per latrine delivered from that 10,000 Riel after the latrine has been delivered. The Village Chief and LBOs remain motivated to deliver the latrine to the end user, because neither of them get paid until the latrine is actually delivered and the customer has paid in full.

- The project did not track cancellations as an official metric, but some staff did track it. General impressions are that cancellations happened about 5% of the time based on the following likely reasons:
    - There is a long lag time between order and delivery. For example, a household may have ordered in June and with an expected delivery in September (sometimes by their own request due to cash flow reasons). However, households change their mind when called for delivery.
    - Families experience medical problems, which meant they had to spend money unexpectedly.
    - Families have other expenses that took priority in the interim of waiting for delivery, such as buying clothes and food or hosting gatherings.
    - Families have problems with rice cultivation due to flood or drought, which affected their expected income.

Challenges

i. High sales agent turnover

Sales, regardless of industry and market, generally sees high turnover because it is a job that requires initiative, persistence, and an ability to deal with unstable incomes. Similarly, for the large part of SMSU, including Going Deep, high sales agent turnover has been a consistent challenge given the low-commission rates and the lack of consistent interest from LBOs to do sales management. In an effort to reduce turnover, the project has invested in increased management support (more direct coaching by project staff), an increase in commission paid by the LBO, and the implementation of deposits, which reduces the waiting time and risks for sales agents.

ii. Capturing granular sales data

As part of their training, sales agents are recommended to record what are known as the "special numbers." The special numbers comprise data that helps the sales agent, the LBO, and the project analyze why sales are strong or weak. For door-to-door sales, these include:

- Number of households who experienced the Family Sanitation Book (the sight seller sales tool)
- Number of sales made from doing Direct Visits
- Number of referrals gotten from each Direct Visit

For group presentations, these include:

- Number of households in the village without latrines (Sanitation Teachers get this from the Village Chief)
- Number of non-latrine households attending the Group Presentation
- Number of sales made at the Group Presentation

As important as these numbers are theoretically, sales agents generally only do the bare minimum, and have a hard time seeing the longer-term benefits of keeping track and documenting and analyzing their efforts. This means that project staff must spend more time doing hands-on observing and coaching, rather than analyzing precise data to identify areas for improvement. The ability to better manage sales agents has improved significantly since project staff have shifted focus from the LBO to the sales agent, although getting granular

data as the special numbers still remains difficult without the project directly controlling sales agents as employees.

3.4.2 Evolution of the enterprise engagement model

While the Pilot Project focused on developing a scalable and sustainable model, a key hypothesis going into SMSU, including Going Deep, was that improving business capacity would lead to developing sustainable capacity and motivation for the market to continue driving uptake.

SMSU experienced several iterations of enterprise engagement.

Iteration 1: Holistic training with a graduation date of three months (start of program)

As part of the project's effort to improve the LBOs' capacity, significant revisions were made to the training curriculum, making it more holistic and intensive. When businesses sign up to receive training, they can select "a la carte" according to their needs and interests. Below are the options from which they are able to select:

Training Options
Latrine Manufacturing and Quality Control (unless already completed and signed off by the RTLO)
Sanitation Knowledge
Latrine Installation and Maintenance
Order Management
Sales and Sales Agent Management
Business Planning
How to Work with Government and NGOs
MFI Credit Test Program (9-12 months for select LBOS)

Table 2: Menu of training options for LBOs, * denotes mandatory courses

Businesses could choose to receive training in just one area or all, with the exception of sanitation and latrine installation and order management, which are mandatory[15]. All businesses are welcomed to sign up for training, but those who choose to receive the complete training package are prioritized as it is most likely those businesses will be well-equipped to succeed. After the core training is finished (typically three weeks), the LBO and ST would continue to receive coaching from project staff. The coaching extends beyond the project staff-LBO/ST relationship. Regional Managers provided weekly one-on-one coaching to the project staff, observing

[15] Business training and the first set of tools are free. There were some discussions about charging LBOs for training, but challenges with getting LBOs to commit to sales management had deprioritized the issue. That being said, the project has learned that it does not need to pay LBOs to attend the initial recruitment workshop.

them on the job and giving feedback and advice. The Regional Managers in turn also received coaching from the sales consultant from WRP, and the Deputy Program Director, both of whom visited the Regional Managers and project staff in a different region every week to observe their coaching and training and give feedback. Although the coaching was very intensive and hands-on, it has proven to be key to improving the sales skills of latrine businesses and sales agents.

Iteration 2: Extended support with ongoing coaching (late 2012)

As time went on, it became clear that LBOs were not able to become fully independent and sustain high sales after only three months of support. Therefore, the project shifted to an "extended support" model of continuing to offer support to LBOs beyond the three months and monitoring the LBO's progress towards independence along four categories: Production, Delivery, Administration, and Sales Development. With this strategy, the project continued to encourage and train LBOs to adopt all aspects of training, including sales management. For those LBOs who had the motivation and capacity to manage their own sales, they received the training and coaching to do so as originally envisioned. These LBOs would then be phased out of training and coaching once the project had determined that they are capable of continuing on their own. For those LBOs who were not motivated or capable of managing their own sales team, but did achieve 5 out of 5 in at least two of the other areas, project staff continued to provide support in sales management.

Iteration 3: Project-managed sales (early 2013)

While some LBOs showed capacity and commitment to managing their own sales force, the majority prefered to only focus on production and delivery. As such, the project shifted focus from training and coaching the LBOs to training and coaching the sales agents directly. This shift saw positive results in terms of sales and a greater optimization of resource allocations. Because the project staff managed sales agents, no longer were sales agents beholden to a unique LBO. Rather, project staff were able to better align demand and supply; stronger sales agents could be matched up with stronger LBOs who can meet the high demand that the strong sales agents are creating. LBOs were able to focus on their core competencies of production and delivery. The increased management support for sales agents has also improved commitment and reduced turnover. Of course, as discussed in the lessons learned section, the evolution of the market facilitation model challenges initial notions of sustainability and scalability. While the project does not have the answer for the best model, it is important to recognize the constraints of focusing on SMEs to sustain active promotion activities.

3.4.3 Supply chain forums

As part of Going Deep, supply chain forums were held about every six months in order to facilitate greater collaboration among actors along the supply chain and encourage local government to support market development efforts. Participants usually included LBOs, sales agents, retail shops, CLTS NGOs, masons, and local government, such as PDRD, DoRD, or the District Governor. Larger raw materials supplier were also invited, but little or no interest was shown.

The forums brought to light that the supply chain for latrines is still quite disjointed. While LBOs, retailers, and masons are usually familiar with each other, they do not interact with each other on a daily basis. Although retailers are aware the LBOs sell the underground components of a latrine, it did not occur to them connecting with LBOs could lead to a business opportunity of selling shelter materials. LBOs also generally had existing formal relationships with masons, but few hire masons to offer installation services, although by the end of the SMSU, teams of masons offering installation services were emerging in Prey Veng province. All three supply

chain actors expressed interest in offering shelter products and services, the development of which would likely bring closer collaboration.

Another issue discussed in the forums was how to leverage economies of scale across the LBOs. LBOs in Svay Rieng are better positioned than those in Kandal, as those in Kandal already generally purchase materials from a main supplier in Phnom Penh. However, there is generally a sense of distrust and fear of competition among LBOs, making it difficult to coordinate closely.

In the supply chain forums, CLTS NGOs shared that they have a specific triggering schedule. LBOs understood that CLTS events create more business opportunity. LBOs report that they have observed many NGOS doing CLTS and they had wanted to get a schedule, but did not know how to approach the NGOs. LBOs requested that the CLTS NGOs share the schedule, but the implementing NGOs reported that they do not have the capacity to keep LBOs informed about the triggering schedules. Going Deep experimented with facilitating a relationship between CLTS implementers, local government, and the private sector, which showed promise, but demonstrated that a dedicated effort and resources are needed to ensure close coordination. Please see section 3.5.2 for more discussion on CLTS/SanMark coordination.

3.4.4 Mason training

In the Pilot Project, the design of the Easy Latrine removed the mason from the supply chain, which was supposed to reduce the burden on the household in terms of time and money; the development of the pre-cast concrete chamber box eliminated the need to hire skilled labor to construct a brick chamber box. However, it turns out that since the households generally construct the shelter along with the underground they still prefer to hire a mason for installation. Because the project had removed the mason from the latrine purchasing experience, households who then hired the mason to help with installation faced challenges. Masons either installed the latrine underground incorrectly, which meant customer dissatisfaction with the product and thereby a negative reputation for the product; or, masons would point-blank ask the households to return the chamber box and exchange it with the traditional bricks.

To ensure customer satisfaction and quality installation, the project conducted mason training sessions in all districts of Going Deep. The training session included instruction on: the main components of a latrine; how to install a latrine; common shelter models, respective components, and prices; and introducing masons to LBOs in the district to facilitate supply chain actor coordination. The mason training sessions have demonstrated value in educating masons on proper installation; connecting masons with LBOs; and connecting local government officials with masons. The mason trainings also served as a relationship development platform to prepare for engagement of masons when the shelter is ready to go to market. As part of an effort to find ways to sustainably scale up mason engagement across SMSU, the project explored engaging local government in the workshops. In several workshops, the project invited district level officials to attend, which proved valuable to having government better familiarize themselves with the latrine supply chain actors and high quality installation procedures.

3.5 Demand side engagement

3.5.1 Behavior Change Communications (BCC)

As part of the Going Deep project, a yearlong Behaviour Change Communications (BCC) campaign was conducted in 20 communes in Kandal and Svay Rieng, leveraging existing national Stop the Diarrhea Campaign

materials. The purpose of the BCC campaign was two-fold – first, to learn whether the additional intervention of a BCC campaign will increase latrine uptake[16]; second, to learn whether the Commune Committees for Women and Children (CCWCs) would be the recommended government partner body for implementing such an intervention.

The first question is answered by using project sales data as a proxy for latrine uptake. Additionally, CCWC implementers were encouraged to track any changes in dry pit uptake[17]. The second question is answered through literature review and qualitative interviews on institutional, capacity, and field conditions of the CCWC as compared with other likely actors.

The campaign comprised of two phases to ensure multiple touch points with villagers, which has been shown to be helpful in achieving behavior change. Both phases comprise of hour-long interpersonal communications (IPC) sessions, in which the facilitator facilitates an engaging experience to trigger people to move along the behavior change path. The messages touch upon both dry pit and pour-flush options. The content of each phase was informed by the user insights research.

Twenty CCWC members served as the direct facilitators of the BCC session. The campaign employed a ToT structure where project staff, Interpersonal Communications (IPC) Advisors, trained, coached, and monitored the CCWC's progress. Additionally, the campaign engaged PDRD and the existing lines of management above CCWC, including DCWC and WCCC to support monitoring and coaching of the CCWC, with the objective of exposing local government to the practice of managing a BCC campaign.

Below is a summary of results. Details can be found in the full BCC Final Report.[18]

- Field experience showed that the BCC sessions did stimulate demand. After the sessions, households were interested in purchasing latrines, which is what led to an effort to integrate a sales component—an evolution from the original model, which tried to keep the BCC sessions explicitly separate from sales. To respond to the demand, the project trained CCWCs on how to speak about the latrine product and connect with LBOs and sales agents.
- Whether or not the BCC work led to an increase in uptake beyond the natural rate of sales still remains to be seen, pending WSP's analysis, which is currently being conducted at time of writing.
- The CCWC overall demonstrated motivation and capacity to carry out the campaign. Project staff monitored the CCWCs' performance according to the categories of Mindset, Skillset, and Toolset, which speak to, respectively, the attitude and approach; the skills, techniques, and methods; and the tools used. Speaking with IPC Advisors anecdotally, both contend that across both Phases, there are only 1-2 CCWCs below average, 3-4 average, and 5 above average for both provinces over both phases. While this is only an impression, it is encouraging to note that the majority of CCWCs are at or above average in terms of performance.

[16] The study of the impact of BCC on latrine uptake will be addressed in a separate WSP report.

[17] Due to time and resource constraints, the BCC campaign did not conduct a project-specific baseline or endline survey. Impact would be determined via the proxy of project sales data for pour-flush latrines and self-reported data for dry pit uptake. The CCWCs also have access to commune self-reported unverified data.

[18] Available from WSP.

- CCWC, when compared with other likely candidates for village-level BCC facilitation such as the village chiefs and Village Development Committees, are the most appropriate when compared against three criteria—the regulatory environment within which they are operating; their general capacity; and the nature of their field presence as it is perceived by villagers and their peers.
- By the end of the yearlong campaign, CCWCs in both BCC districts and non-BCC districts were motivated and interested in further exploring how they might continue implementing BCC activities using their own budgets. At time of writing, the Government of Cambodia has just shared the national BCC guidelines, which were influenced by project's experience with social marketing and BCC. The Going Deep BCC experience was a positive testament to the potential of government taking an engaged, influential role in increasing rural sanitation uptake when proper evidence-based tools, training, monitoring, coaching, and incentives are provided.

3.5.2 CLTS/SanMark Coordination

Given that CLTS and SanMark are complementary efforts, the project coordinated with PDRD and local NGOs Sentesana and CFID who were conducting CLTS activities in Svay Rieng. (Kandal did not experience any CLTS activities during the Going Deep project period.) The purpose of this initiative was less about measuring the impact of coordinating CLTS/SanMark on sanitation uptake; rather it was to learn more about how CLTS/SanMark coordination might work, the challenges to coordination, and how government might be engaged to implement efforts at scale.

The model was to facilitate the transfer of knowledge about CLTS schedules to the private sector actors so they can take advantage of increased demand during sales presentations. Early on, the project served the role of the facilitator. Project staff met with CLTS implementing partners to get information about the triggering schedule. The project staff then passed on the schedule to the business owners in that area and their sales agents. They are recommended to conduct sales events at the CLTS villagers both before and after. Whether they do is ultimately up to them. The project cannot dictate any timeline or commission structure.

Later on, the project explored whether local government could continue to play the role of facilitating knowledge transfer of trigger schedules. A training workshop was held with the PDRD and DoRD of Svay Rieng to discuss a potential role for them. PDRD appeared open to the ideas but do not see it as a main priority. DoRD also communicated that they could support CLTS/SanMark coordination if NGOs and PDRD supported and funded them to do so.

Aligning Government and Business Interests: The VDC Case Study

In Cambodia, there exists what is known as the "Village Development Committee," a government established committee of village representatives who are supposed to support development activities, including liaising with development partners. With respect to CLTS, VDC members have been tasked with helping the CCWC, who do the actual triggering, in organizing the logistics of CLTS meetings and following up with villagers. However, they do so on a voluntary basis and are not paid, unlike the CCWC.

Initially in discussion with CLTS implementing partners, PDRD requested that VDCs are trained to be sales agents so they are compensated for their efforts in following up with villagers about buying or building a latrine. While LBOs can hire anyone to be a sales agent, the project has learnt that LBOs are more successful with fewer, more dedicated sales agents that fit the profile of a successful sales agent (enough time, generally younger, female, outgoing, good speaker). It would be very difficult for LBOs to manage sales agents from every CLTS village and unsustainable for the project to help train sales agents who would likely only sell in one village.

Despite these reasons, PDRD remained insistent on having VDCs serve as sales agents because they have been mandated to promote VDCs as a government initiative, and they felt VDCs were not being compensated for their efforts in CLTS. After bringing in PLAN into the discussions about why VDCs would not be optimal sales agents, the partners have agreed to the above described model where LBOs decide for themselves who will serve as sales agents.

Lessons Learned

1. Sustainability remains of critical importance for how relationships are structured. Whatever is done to coordinate CLTS and sales should be scalable across the country.

2. If indeed the VDCs are contributing value by following up with villagers and encouraging behaviour change, then their efforts should be recognized and compensated—not just the CLTS facilitators. Often the "last-mile" actors are not rewarded for their efforts, even though they are critical for following-up on the main intervention efforts and "tipping" individuals off the inertia cliff to finally make that behaviour

Box 1: Aligning government and business interests—The VDC case study

3.5.3 Other marketing experiments

In light of the learnings of the User Insights/Market Segmentation research, Going Deep explored several ideas to further increase market penetration. A summary of the initiatives is presented below:

	What is it?	Scope/Scale	Result
Customer referral card	Referral cards that new customers, masons, and retailers can pass on to recommend LBO.	All trained LBOs received first 100 cards free; they are encouraged to reproduce at own cost thereafter	Referral cards have been seen to converge with business cards in terms of purpose and usage.
LBO/ST Business card	Marketing material with LBO/ST contact info	All trained LBOs received first 100 cards free; they are encouraged to reproduce at own cost thereafter	Businesses and sales agents find business cards very useful as a tool to easily hand out to potential customers and leave contact information. Some LBOs have continued to reproduce their own.
Certificate of latrine purchase	Certificate showing (off) latrine purchase; will encourage government to participate and take on public recognition to motivate purchase	All trained LBOs received first 25 certificates free; they are encouraged to reproduce at own cost thereafter	LBOs and sales agents do not perceive the effort of handing out certificates to have direct impact on sales and therefore do not show strong enthusiasm. However, certificates held potential to enhance the efforts of the BCC campaign by leveraging CCWC and village chief influence to motivate households to give a public commitment to building or buying a latrine. The project therefore will integrated certificates within the BCC campaign, encouraging CCWC and VCs to award certificates during the Phase II session to those who bought a latrine since attending Phase I. Moreover, certificates were handed out to those who chose to buy during Phase II meeting. 1000 certificates from the National Stop the Diarrhea campaign toolkit were printed for this purpose. The certificates call for signatures from the commune chief, CCWC, and village chief. Households appear to derive a sense of pride when receiving the certificate during the BCC session.
MoH as social marketing channel	Supplying sanitation and market information at health centers	6 Health Centers (HCs) total, 3 per province, and provide promotional materials	Only a handful of sales resulted from the light-touch engagement of health centers. Health center staff report that they are too busy to thoroughly discuss sanitation with patients and that many patients already have a latrine. While the health centers can serve as another touch point for potential customers, without a significant increase in intensity of engagement, health center engagement does not show promise to have significant direct impact on project targets.

Table 3: Other marketing initiatives of Going Deep

3.6 Sanitation Financing

3.6.1 Background

As part of the Sweep 2 efforts of enabling more households to access latrines, the project developed partnerships and models for household sanitation financing (SanFin) implemented by iDE and PATH. In partnership with two Cambodian Micro Finance Institutions (MFI), VisionFund and Kredit, the SanFin project had three main goals.

- Develop a latrine loan product that would reduce household cash constraints making it easier to purchase a latrine
  Implement and optimize an operational model with MFI partners with the goal of finding a sustainable and scalable solution
- Document the results of the program from a private sector and socioeconomic perspective

More detailed discussions about the SanFin pilots can be found in the Final Report for Sanitation Financing.[19]

3.6.2 Operational model

The general model of Sanitation Financing developed under this scope was designed to integrate with the existing Sanitation Marketing operations, whereby:

- Latrine products were sourced from independent Latrine Business Owners (LBO).
- Sales agents, known as Sanitation Teachers (ST) collected households in each community and sold latrines through a group sales method.
- Field loan officers from each MFI attended the group sales meetings to offer the households the option to purchase latrines on credit.
- Sales orders and loan applications were completed at the end of group sales meetings.
- Once approved, loan funds were disbursed directly to LBOs who then delivered latrines to households within a few days.

[19] Available with permission from WSP.

Loan Terms	Kandal: VisionFund	Prey Veng: Kredit
Basic Structure	Group Loans (2-10 households)	Group Loans (3-6 households) Individual Loans (1 district)
Repayment Location	Village	Group Loans: Village Individual Loans: Initially branch, but later changed to village in response to very low demand
Size	$40-$350	$40-$250
Duration	4-12 months initially, 6-18 months by end of pilot	6-12 months
Repayment Method	Declining or Balloon	Group Loans: Balloon Individual Loans: Declining
Interest Rate (per month)	2.6%-2.8%	Group Loans: 2.85% Individual Loans: 1.65%-2.85%
Disbursement	Small Loans: To Supplier Large Loans: Initially to household, but discontinued as VF could not verify use of loan	Small Loans: To Supplier Large Loans: To Household

Table 4: Summary of loan products developed in the Sanitation Financing Pilots

A large portion of the SanFin project was to work with the MFI partners on developing loan products and processing protocols that would be more appropriate for a $40 latrine loan, which is much smaller than their typical loans that start around $200, which have much more rigorous paperwork and collateral requirements. Below is a summary of the operational improvements made through the pilot and the lessons learned

	Quasi-Dedicated/Dedicated Field Staff	Immediate Post-meeting Loan Application Processing	Number of Loan Processing Steps
VisionFund	Adopted during the pilot, proved operationally successful	Implemented from the beginning of the pilot	Immediate loan decision and able to skip CBC[20] check for most loans during the pilot
Kredit	Not adopted during the pilot, but willing to try for future SanFin activities	Adopted during the pilot, proved operationally successful	Immediate loan decision during the pilot but was not able to skip CBC check during the pilot

Table 5: Summary of operational Improvement

	Lesson	Explanation
1	MFI operational adjustments such as dedicated loan officers, immediate post-sale loan application completion, and disbursing funds to supplier make a huge difference.	Operational adjustments dramatically improved field coordination, happier customers, greater volume of loans, more sustainable compensation for sales agents and latrine producers
2	Branch repayment does not seem a viable option for small sized loans currently.	There was almost no demand for branch repayment in Svay Antor (Prey Veng) and a sudden increase in demand when repayment location changed to village.
3	Not all latrine businesses can produce enough latrines in a consistent fashion to warrant an MFI partnership.	Some latrine businesses were unable to improve their production and delivery capacities enough to warrant MFI coordination. An increase in demand by financing needs to be matched by an increase in supply.
4	Setting targets such as number of sales meetings or number of loans is important for the MFI	Concrete goals help the MFI plan for the appropriate resources and helps avoid MFIs only participating for the "corporate social responsibility" benefits.
5	There is significant household demand for loan to pay for complete latrine including shelter.	There was a significant amount of principal disbursed for large-sized loans, which bodes well for financing for a packaged shelter product, which iDE is currently working on.
6	Engaging MFIs that are new to social product loans is challenging, and limited grant funding with the goal of financial sustainability is very helpful.	MFIs face new unknown risk, added upfront planning and operational costs, and added data tracking and sharing costs. PATH used limited grant funding tied to key milestones during only the pilot period with the clear goal of financial sustainability in order to catalyze MFI risk taking. Both MFIs have continued SanFin field activities post pilot and are interested in to scaling-up new territories without any NGO grant funding (discussions ongoing).

Table 6: Operational Lessons Learned from SanFin Pilots

[20] The CBC refers to the Credit Bureau of Cambodia, which was launched in March 2012. After its establishment, financial institutions were required to check a potential customer's credit history with the CBC before approving a loan application. However, given that the CBC was so new, very few customers were actually listed in the CBC, and it was more an exercise of compliance in the case of the pilot.

3.6.3 Results

KANDAL	Total	Months 7-9	Months 4-6	Months 1-3
VF Reported MIS Data				
Total issued[21] sanitation loans	941	360	345	236
PATH Operational Data[22]				
Avg. weekly sales meetings	8	11	6	7
Total orders with cash	981	381	343	257
Total orders with credit	1,811	708	590	513
Closing Percentages[3]	65%	86%	64%	42%
IDE M&E Data				
Latrines delivered (cash and credit)	1,290	572	440	278
PREY VENG	Total	Months 7-9	Months 4-6	Months 1-3
Kredit Reported MIS Data				
Total issued sanitation loans	1,062	604	396	62
PATH Operational Data [2]				
Avg. weekly sales meetings	18	17	16	25
Total orders with cash	3,671	1,157	975	1,539
Total orders with credit	2,038	1,144	702	192
Closing Percentages[23]	45%	50%	44%	41%
IDE M&E Data				
Latrines delivered (cash and credit)	5,077	1,990	1,855	1,232

Table 6: Summary of the key SanFin pilot results:

[21] VisionFund experienced data tracking and reporting issues throughout the entire pilot. While, PATH tried to help VF locate potentially missing loans within their MIS system, PATH feels that some amount of loans were not properly reported and therefore the 941 total loans is likely an understatement of actual loans issued.

[22] PATH collected weekly data on the pilot's field operations as a way to actively monitor the pilot. This data is likely less accurate than the monthly MFI reports but it is valuable for observing trends and quantifying some additional details like the number of sales meeting participants, cash orders, and closing percentages.

[23] PATH believes that the closing percentage data in Kandal may overstate the reality because project staff collected this data from the sales agents on a daily basis immediately after the sales meetings ended. However, in Prey Veng, this data was collected on a weekly basis which allowed time for households that attended the sales meetings to change their minds and either cancel an existing order or place a new order that was not originally noted. In addition, if multiple people from a single household attended the sales meeting, they were counted as only 1 participant to make the closing percentage more accurate. Lastly, if someone who attended the sales meetings already owned a latrine, they were not included as a participant in an attempt to make the closing percentage more accurate.

The results point to several notable implications:

	Data	Implication
1	Kandal: 941 loans disbursed Prey Veng: 1,053 loans disbursed (over 9 months, confirmed by MFIs)	Households want loans designed to help improve family sanitation.
2	Kandal: 65% avg. closing percentage Prey Veng: 45% avg. closing percentage	Households have a strong desire to purchase a latrine as closing percentages are high by sales industry standards.
3	Kandal: 35% of orders on cash Prey Veng: 64% of orders on cash	Credit sales do not eliminate cash sales. One hypothesis (among others) is that less mature markets such as Prey Veng (less previous NGO/government sanitation work, less of an MFI presence, lower sanitation coverage rates) seem to have higher demand for cash sales.

Table 7: Implications of Pilot Results

While Sanitation Financing holds great promise to increase household demand cost-effectively, it can only be sustainable and scaled if it were demonstrated to be financially viable for the private sector MFI partners. Thus, an external assessment was conducted by PricewaterhouseCoopers to analyze the profitability, risk, and impact of SanFin for MFIs. Table 8 is a summary of the results and implications of the report.

	Result	Data
1	More than 100% cost recovery by the end of the pilot periods for both MFIs	Operating Self Sufficiency Ratios of 100%-120% in the final months of the pilot for both MFIs
2	Operating costs decreased dramatically as pilots improved field operations and loan volumes increased	Starting from 10%-20% of Gross Loan Portfolio and decreased to 1%-3% for both MFIs
3	No defaults nor very late payments for both MFIs	Repayment rate 100% and no PAR > 30 days for both MFIs
4	Good source of customer acquisition for both MFIs	Majority of SanFin clients were new (60%-80%) and customer retention rates were acceptable (10%-20%) for both MFIs
5	Social funds can greatly improve the profitability of SanFin loans	Both MFIs have access to various sources of social and commercial funds, costing from 0%-15% per annum and some social funds specifically require loans for sanitation or similar purposes
6	Sanitation financing can effectively reach poor households	Kandal: 54% of SanFin customers below PPI Cambodian National Poverty Line 22% of SanFin customers below PPI USAID Extreme Poverty Line Helped MFI reach much lower down their poverty scale compared to their regular loans Prey Veng: 10% of SanFin customers were ID Poor 1 18% of SanFin customers were ID Poor 2 72% of SanFin customers were Non-ID Poor Prey Veng as a province has 12% ID Poor 1 and 15% ID Poor 2 according to MoP, which mean that SanFin helped Kredit reach a larger proportion of poor customers than they would have just randomly sampling from the population.

Table 8: Results of the external assessment on profitability, risk, and impact of SanFin for MFI partners

Notable in the results of the study is that latrine loans are profitable, low risk, and good sources of customer acquisition for both MFI partners by the end of the pilot. This is a step forward in proving that sanitation loans can be financially viable for the private sector to incorporate into their portfolio. Interestingly, despite these promising signs, the MFI partners thus far have been slow to consider scaling SanFin across their operations. In discussions with them, it appears that SanFin still falls under their "social" loan programs, and while profitable, they are not as profitable as other loan products, and thus, they do not anticipate incorporating SanFin loans as a core part of their business in the near future; the implications of this being that the MFI partners will be projecting much lower targets than the project. For example, VisionFund had expected to reach 5,000 latrine loans across the country during "scale-up" while the project had expected more around 40,000. This stark contrast in expectations for SanFin is an indication that more work still needs to be done to bring MFI partners fully on board to address the strong demand for latrine loans.

3.6.4 Informal SanFin relationship

An informal relationship—informal because it occurred outside the territories outlined in the formal MOU — between VisionFund and project staff developed in the northern provinces of Kampong Thom, Banteay

Meanchey, and Oddar Meanchey, whereby project staff and sales agents would call a credit officer to attend a sales meeting, and more often, call the credit officer to come to the village to process loans after a sales meeting already occurred. The project allowed this to continue as an experiment to compare the merits of a formal and informal MFI partnership. The informal partnership skipped out on all the key components of the formal partnership, ex. credit officer present at every meeting, immediate loan processing after sales meeting, and thus had a higher likelihood of missing out on interested clients. However, it is much more difficult to maximize intensity of sales efforts due to the ad hoc nature. To date, the informal partnership has led to over 3,300 latrine loans, and informal activities are ongoing.

3.6.5 Willingness-to-Pay Study

Concurrent with the SanFin Pilots, with support from the Bill & Melinda Gates Foundation, the project conducted a series of Randomized Controlled Trials to answer two key questions: *What is the uptake of latrines (true willingness to pay) at different price points, i.e., what is the full demand curve for latrines? Does offering financing for latrines increase willingness to pay for latrines?*

Modeled after the SanFin pilots, the experimental study hired and researchers who formed a full-time latrine sales team, working with VisionFund microfinance institution to offer loans (group liability, 12-month declining balance loan at 2.8% interest per month) for latrines in treatment villages. The "non-financing" group received the standard village latrine sales pitch, using the Becker-deGroot-Marschak (BDM) mechanism to determine the price they were willing to pay, with full cash payment required on delivery of the latrine. The "financing" group received the same standard village sales pitch, but was also offered loans specifically to finance the purchase of a latrine. The BDM game was used to determine the maximum willingness to pay in terms of *monthly installment*. The schematic below highlights the terms of the loan and how it was integrated into the BDM pricing game:

BDM Structure with financing – mimics standard village sales process closely

1. Client receives standard village group and individual sales pitch
2. Client educated on financing package during group and individual sales pitch
3. Client plays BDM game – states desired maximum monthly installment payment to make over 12 months (as per terms described above)
4. Client randomly draws a monthly payment from envelope. If drawn price is lower than bid price, must buy; if drawn price is higher than bid, cannot buy

Sample

Thirty representative villages were selected from Kampong Thom province. Fifty households that did not own a latrine in each village were selected at random to participate.

Methods

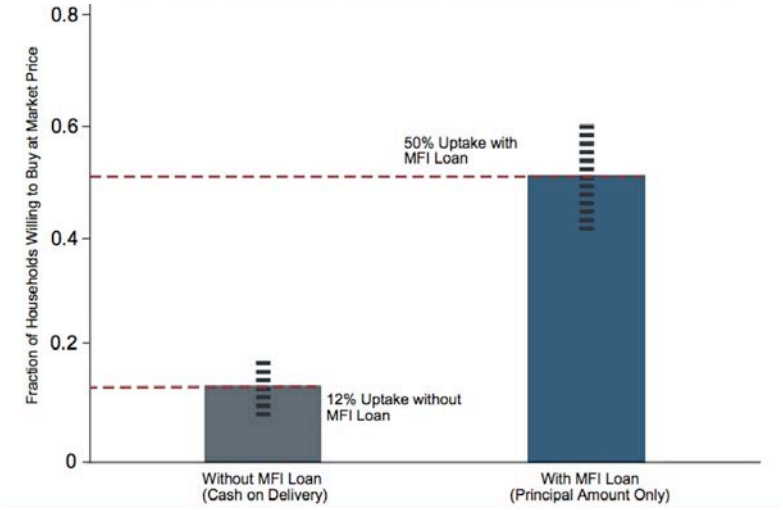
The true WTP for latrines was measured using the Becker-deGroot-Marschak (BDM) mechanism, which is an incentive compatible auction procedure used in experimental economics to accurately measure WTP. Bids were

binding, and winning respondents were required to purchase a latrine. A cluster randomized trial was then used to assess the impact of financing on latrine uptake. Villages were randomly assigned into 15 control (Cash on Delivery) and 15 treatment (MFI Loan) villages.

Results and Conclusions

The experimental study showed that average willingness to pay for a low-cost sanitary latrine is 28 US dollars (USD), as compared to the average market price of 50 USD. In the cluster randomized trial, we test the impact of offering a latrine financing package (in the form of a declining balance 12 month loan with 2.8% monthly interest) on latrine uptake. We find that willingness to pay for latrines increases from 28 USD without financing to 50 USD in principal (excluding interest on the loan) with financing. This means that 12% of all non-latrine owners would buy a latrine at market price without financing, whereas 50% would buy a latrine at market price with financing (see Figure 7). Furthermore, the operational cost per latrine sold is decreased by 70% in the financing arm, because many more latrines are sold at each village sales meeting. This four-fold increase in sales at market price and 70% decrease in operational cost per latrine sold due to financing provides strong evidence that expanding access to consumer financing for latrines has the potential to dramatically improve sanitation in rural Cambodia. For more information, please see the full report on Willingness to Pay.

Figure 7: Uptake of Latrines at Market Price With and Without An MFI Loan



Deciding Between Direct and indirect Sales for Household SanFin Pilot

Because the scope of the sales revisions was not anticipated to be so significant, it was not expected to have such overarching influences in all other program activities. One particular activity that struggled to fully integrate with the sales revisions is the household MFI pilot. The tension arises from the fact that sanitation financing currently only allows for group sales because of the group loans, which offset the need for collateral and are faster to process and therefore less costly. This conflicted with the new focus on door-to-door sales, the effect of which is felt in not only activities of Sanitation Teachers, but training of field staff who train the sales agents.

At the time of development, both the SanFin and sales revisions were new initiatives being tested, so it was decided that the MFI pilot will proceed with group sales, adapting the sales training and tools as fit for the MFI pilot, but with regular check-ins to identify opportunities for further integration. By the end of the pilot, discussions around MFI scale-up have focused on continuing only with group sales. There have been instances in the informal partnership with VisionFund in the northern region where sales agents have offered financing in door-to-door sales and later called the credit officer to come process applicants. While this may have worked in one-off situations, it is difficult to scale due to the protracted loan-processing timeline that happens the credit officer is not present at the sales meeting.

Box 2: Deciding between direct and indirect sales for HH SanFin pilot

3.6.6 Supply chain financing

The SanFin project also looked into the need for supply chain financing, but initial results found that LBOs working in the pilots had adequate access to capital. However, this may have been because they were selected for their existing higher capacity, and other LBOs may not be aware of all their financing options. Thus, a presentation was developed to educate LBOs on their options for financing and introduce them to the process of applying for a loan. After the SanFin pilot, the project conducted several financing workshops with LBOs, who found the material new and interesting. Moving forward, there is a need to develop more in-depth training and coaching for LBOs who need help going through the loan application process. Capital and cash flow is emerging as a definite constraint for LBOs, and project experience does show that while there is not an explicit demand from LBOs for financing, there is likely latent demand that can be unleashed once proper education and awareness efforts are made.

3.6.7 SanFin Lessons learned

Market readiness cannot be dictated

The original intent of the SanFin pilot was to find partners in Kandal and Svay Rieng, keeping to the Going Deep project area. However, finding an interested MFI partner in Svay Rieng was unexpectedly difficult due to the poorer demographics of the region, and relatedly, the lower presence of MFI institutions in general, and the

small loan size of the latrine underground product. Other potential partners like ACLEDA and Prasac had low motivation for partnership given their existing partnerships with WaterSHED, another NGO, in other regions. The problem was eventually solved by moving the SanFin pilot to Prey Veng, where a suitable MFI partner could be found. A lesson learned from this challenge is that market-based approaches need to be adaptable and responsive to market realities. Also, to the extent reasonably possible, market conditions, constraints, and opportunities—such as the availability of MFIs, in this case—should be researched and understood before selecting target areas.

WASH financing is still a nascent development

Despite the numerous MFI benefits demonstrated during the pilot, including: profitable loans, high repayment rates, opportunity to acquire new customers, customers who are healthier and therefore better able to pay back loans, and contribution to the MFI's social impact objectives—MFI partners were not yet willing to scale SanFin to the extent that the project would have liked to see. SanFin is still far from becoming a core part of the MFI partners' business models, and likely will not be in the near future. The challenge, then, is to continue developing models of partnership with MFIs that will optimize their available resources and work within their business constraints, but continue to demonstrate the value of growing the SanFin loans in their portfolio.

Setting up partnerships with MFIs is a hands-on process

Developing a successful SanFin partnership in large part depends on getting the operations right. The increase in complexity in the sales and operations process makes the task more challenging: more room for interested customers to be missed; more complexity in the sales pitch; more complexity in coordinating loan processing and delivery. As such, the bulk of the work in developing a SanFin arrangement is improving operations, which requires a lot of hands-on technical assistance to the MFI partner (and sometimes financial assistance to first attract their participation). Even working with an MFI partner who is already familiar with the process (e.g., VisionFund's experience with Hydrologic and the water filter loan) does not guarantee efficiency from the start. Given current conditions of the WASH financing market, any future projects looking to do SanFin via MFIs should be prepared to invest significant active participation in the relationship.

3.6.8 Moving forward

Despite the challenges of scaling up SanFin via MFIs, iDE continues to ways to further engage them and overcome the obstacles. Current explorations include coupling a smart subsidy with financing, in-house financing, and bundling WASH products to effectively increase the loan size.

3.7 Working with Government and other NGOs

3.7.1 National level engagement

Engagement at the national level has supported development of market-friendly policies and improved coordination among development partners. Below is a summary of activities and current status:

1. In deciding the project territory of SMSU (including Going Deep), the government and other development partners coordinated provincial selections to maximize impact and minimize redundancy.
2. The project shared with the sector-at-large learnings such as the formative research on government engagement and the impact of microfinance on latrine uptake.

3 The project supported the development of the rural sanitation and hygiene sub-working group, which seeks to foster deeper discussions that go beyond the coordination-level of discussions at the national WATSAN meetings. Notable discussion topics that drew on project experience include: CLTS/SanMark coordination, working with monks, BCC, and sales.
4 The project collected input from MRD and other NGOs for the development of the BCC campaign, and subsequent campaign experience was shared with shared with the sector in the development of a national BCC strategy, which is still undergoing development.
5 The project collected input from members of MRD and other NGOs for the development of designs for the challenging environments.

3.7.2 Sub-national engagement

As the government engagement formative research showed, there were opportunities to engage government at the sub-national level beyond just PDRD. Thus, the project explored opportunities to leverage ongoing D&D activities and continue increasing awareness and capacity of local government to support rural sanitation.

- The project engaged the CCWC as the main facilitators of the BCC campaign, and integrated CCWC line ministry offices and PDRD to support monitoring and coaching. The CCWC have expressed interest in continuing the BCC efforts using their own commune resources, and WSP is exploring ways to continue encouraging such enthusiasm.
- The project engaged PDRD and local NGOs Sentesena and CFID on CLTS/SanMark coordination in Svay Rieng, initially demonstrating what coordination might look like, and then providing a workshop training to PDRD and DoRD on how they might continue facilitating the coordination. PDRD has expressed interest but request resources to do so.
- To encourage greater coordination among development partners and ownership of PDRD over coordination, the project, with the support of UNICEF, advocated to both Svay Rieng and Kandal PDRD to host regular subnational WATSAN sector meetings. The effort was met with mixed interest. PDRD in Svay Rieng expressed more enthusiasm, while Kandal PDRD expressed tepid interest, which is in line with the experience from the Pilot Project. Depending on availability of funding from Svay Rieng, PDRD actively organizes sectoral meetings to discuss coordination and progress. Both PDRDs are supplied with monthly reports by Regional Managers on sales, project activities, challenges, and opportunities for PDRD to help overcome challenges.
- PDRD, district governors, and DoRD are invited to attend all project workshops to give their input and support. Of note, local government support was important to lend legitimacy to the supply chain workshops, the launch of SanFin, and mason training. At these workshops, government would add their specific concerns, which helped the project stay aware of government's considerations.
- The project explored integration with the development process as part of the Ministry of Interior's local planning process, such as the District Integration Workshop, where Commune Councils invite NGOs to coordinate development plans as they are developing their 5-year, 3-year, and 1-year plans and budgets. The project found that the challenge of engaging in such platforms was that most local government officials still only considered subsidy as a way to support rural sanitation, and did not understand the role of market facilitation. Thus, it was difficult to report plans according to the frameworks and metrics that the DIW and NCDD are typically used to. It would be worthwhile to keep a pulse on the development of the D&D process, especially as it relates to how districts and communes

can plan their own budgets and development plans, which might be able to integrate learnings from such successful experiences as the BCC campaign.

- When supported with a thorough program of resources, plan of activities, and coaching, local government are generally motivated and capable of supporting rural sanitation. There remains a contrast between the level of interest in Kandal versus Svay Rieng, but business activities remain unhindered despite lack of support; support from government can lend legitimacy and facilitated more efficient coordination among development partners.

3.8 Lessons Learned – Project Implementation

3.8.1 Ongoing coaching, not just one-off training is key to success in sales and general management

Successful sales skills cannot be taught in a single training or even a series of trainings. Rather, selling is a skill that must be learned with ongoing monitoring and coaching. In the project, the professionalization of sales went hand in hand with a tiered structure of sales management, which provided the ongoing support necessary for continual sales growth that undergirded project projections and strategy.

3.8.2 Tiered coaching is conducive to effective sales management

Critical to the success of a sales agent is a skilled sales manager who supports the sales agent through coaching, motivation, strategy development, territory management, and overcoming mental blocks of both the customers and sales agent. The sales manager also receives coaching from the Deputy Program Director, who receives ongoing coaching and mentoring from the sales consultant. Throughout the management structure, from the head office managers to the sales agents, coaching is done using WRP's RACE™ framework (Results = Attitude + Competency + Effort), which provides a systematic approach for discussing sometimes sensitive challenges facing each individual.

3.8.3 Results-based pay drives results

The project developed an results-based staff compensation structure using performance incentives to motivate staff to focus on achieving results. Staff go through quarterly reviews and the incentive structure is modified quarterly to reflect the core objectives of each quarter. For example, at the beginning of the project, the focus was on building up a solid foundation of LBO capacity, so staff were incentivized on how well they trained and coached LBOs as measured by managers' observations. As the project progressed, achieving high sales targets was the focus and staff incentives were primarily based on sales results. As the project shifted to focus on capacity development of sales agents, the incentives were based on the number of high performing sales agents recruited and trained. The results-based pay structure was an effective tool because:

1) It keeps staff focused on achieving the defined immediate objectives
2) Provides clear metrics of success that staff are measured upon
3) Allows flexibility for updating objectives given changes in program focus

3.8.4 Align incentives and have clear, harmonized objectives to manage innovation and scale simultaneously

The Going Deep sub-component was an innovation-focused project within a larger project (SMSU) that was focused on at-scale implementation of core project activities. The different natures of innovation and scaling up

can, at times, create tension, the former operating within an environment of flexibility and uncertainty; the latter focused on optimizing efficiency. This tension, when coupled with rapid growth, can lead to growing pains. For example, the project experienced tension in having to share resources, especially staff time, across Going Deep and Scale-Up, which had same goals but different focuses. The challenge arose because the same staff members were assigned to specific tasks in both SMSU and Going Deep, the former whose focus was to optimize efficiency of proven models and the latter to iterate on innovations. While the focus of scale-up is to recruit and train as many successful businesses as possible, those successful businesses could only optimize their potential to sell if Going Deep identified effective market penetration strategies. Going Deep strategies will only be relevant if there are competent, well-trained businesses to take the ideas to scale.

To ensure that project activities reflected the harmonized nature of SMSU, the project aligned incentives such that staff were also evaluated on how well they coordinated with and supported the other aspects of SMSU outside their immediate responsibilities. Incentives can be used to leverage the productive tension between innovation and scale and optimize the benefits of each. Managing innovation within a project focused on scale will be the key to continued growth and impact.

3.8.5 The project approach should be adapted over time to find the most effective way to reach objectives based on project experience

Sanitation Marketing – market development for sanitation – in Cambodia, has for the most part taken the form of market facilitation—development partners building up the capacity of private enterprises to stimulate demand and provide supply to satisfy that demand without becoming directly involved in the market transactions. However, project experience shows that pure market facilitation is not necessarily the best model for reaching the public health goal of rapid and widespread latrine uptake. Despite being independent, sustainable businesses in their own right, concrete businesses showed inconsistent capacity and enthusiasm for conducting their own active sales management. Given the public health goals of rapidly improving latrine uptake rates, the project adjusted accordingly and began exploring alternative approaches of market engagement, such as the Direct Sales Model (DSM) experiments in Kandal (funded by the Stone Family Foundation) and Koh Kong (funded by the Swiss Red Cross, the Stone Family Foundation, and CARE). The learnings from DSM Kandal and Koh Kong showed that a dedicated sales force managed by the project does indeed stimulate high levels of demand. As such, the project shifted the focal point of intervention from the LBO to sales agents, building up a sales force that is more full-time to reduce turnover, with dedicated management by project staff. As market conditions continuously evolve, project intervention methods should reflect ongoing learnings about market capacity and maturity, and adjust interventions accordingly.

3.9 Further product development

3.9.1 Design for challenging environments

Background

While the Easy Latrine design from the Pilot Project helped to ignite the sanitation market and enable more poor rural households to access sanitation, it is not suitable for some of Cambodia's more challenging environments. With input from WSP and MRD, two challenging environments were selected—seasonal/predictable flood prone zones and areas with high water tables. These environments were selected based on choosing environments with the largest population and greatest potential business opportunity.

Using Human-Centered Design (HCD), the HCD iLab of iDE set out to design sanitation solutions for challenging environments that are accessible, affordable, and desirable for the target population, given the local context and supply chain. While the objective was to design a solution fully market-based, it was recognized that subsidy might be necessary.

Research

The information gathered during the initial research phase is analyzed and synthesized in order to extract major themes and patterns. What results are the key user insights. Key insights are then transformed into a set of core design guidelines. Design principles are the foundation on which ideas are generated and solutions built. Figure 8 below summarizes the key insights and design principles. The user insights identified a variety of barriers to adoption (shown in red). These barriers manifest throughout the user journey: before purchase, during the purchase and installation, and later during continued use. The design principles provide guidance as to how each of these barriers (shown in blue) might be overcome. Overarching themes are shown in green.

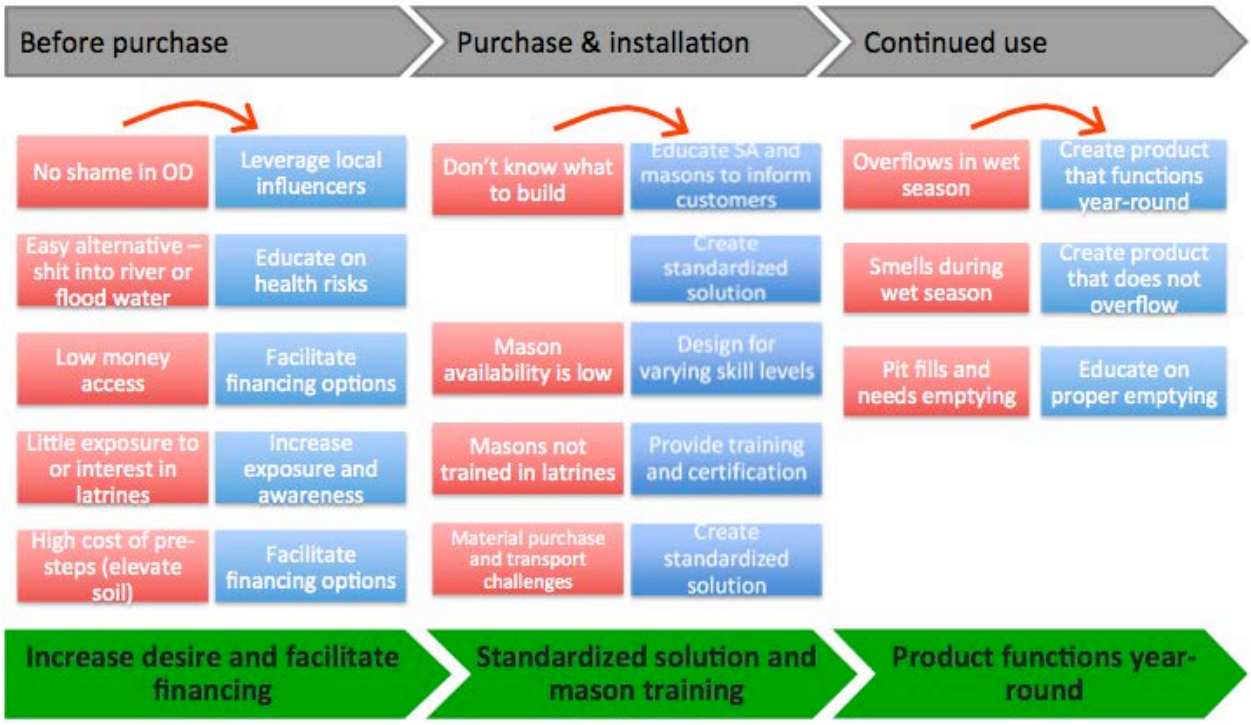


Figure 8: Key insights and design principles

Product Development

The issues of waste management

The initial research showed that there are currently no known functional, sanitary product solutions for challenging environments. Current solutions (open pits, draining into rivers, infiltrating into HGW) are not hygienic as they contaminate water sources used by households. A long-term sanitary solution requires either:

- a waste treatment system that renders the waste harmless or
- a sealed system coupled with a waste emptying service.

No known waste management systems exist in rural Cambodia and would need to be developed. With this design project, this dimension/concern adds complexity to the project, as well as complexity to the potential success of scaling appropriate sanitation behaviors and products. Part of the design project brief/scope was to "drive rapid penetration and continued usage of latrines." With the learning that the pit fills in under a year, waste management will be a key requirement in order to achieve "continued usage" of latrines as, in part, the ramifications of poor waste management planning is felt by households within a short time frame of making the purchase. However, exploring waste management was not part of the original scope of the project. Thus, the project explored other options that would not require waste management.

Prototyping

Prototyping entails gathering user feedback on concepts early and often, prior to final-build and testing. The goal is to maximize user input and critical refinements to the design, while minimizing investment in costly prototypes.

Elimination of High Ground Water Areas

With input from MRD and other NGOs, insights were gained into HGW areas. The insights had significant implications to the path forward to further prototyping.

1. Inability to identify HGW areas:

> Through prototyping user research, the learning revealed that households do not know if they have HGW. No accurate data exists to identify ground-water levels or its seasonal changes (HGW can be seasonal) throughout the country. HGW would need to be determined on a case-by-case basis.

2. Technology constraints of HGW Design:

> A product that protects HGW must be either:
>
> 1. A sealed system to isolate waste, with waste management system to regularly empty, or
> 2. A product that treats the waste to avoid emptying

As previously discussed, the former option of developing a regular emptying service was determined to be outside of the scope of the current project, and the latter option still requires significant R&D as none of the solutions currently in development are readily available in the market or have been fully proven.

Based on the previous decisions around waste management and the need for this project's solution to be immediately tested and implemented, it was decided that moving forward the focus would be on designing for flood areas only, excluding areas with HGW.

Even with the elimination of HGW areas, the project still addresses 88% of challenging environments users.

Proposed technical design

A desirable, sanitary and sustainable solution requires a technical design that works year-round. The solution must function properly during the flood periods (not overflow or contaminate the water) while in the long term allowing for infiltration during the dry periods.

Could we develop a system that functions as a closed/sealed system during the floods, and an open/infiltrating system during the dry season?

Figure 9 below describes the proposed technical design for severe flooding:

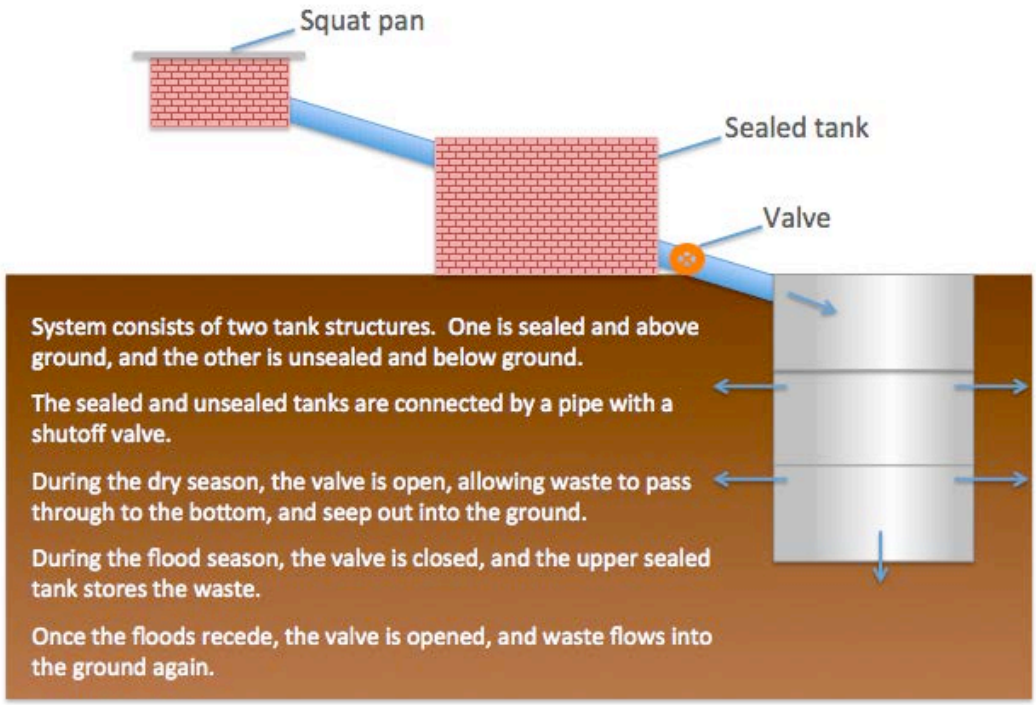


Figure 9: Proposed technical design for severe flooding areas

For moderate flood areas, the design can be simplified.

For moderate areas (<1m of flooding for less than 1 month), an elevated latrine design[24] can be installed, adding a gravel perimeter around the concrete rings to facilitate infiltration. The gravel area will depend on soil infiltration rates.

Rings are stacked above-ground in addition to underground rings. These stacked rings must be higher than the maximum flood level.

[24] * Page 60, "Informed Choice Manual", Department of Rural Health Care Ministry of Rural Development

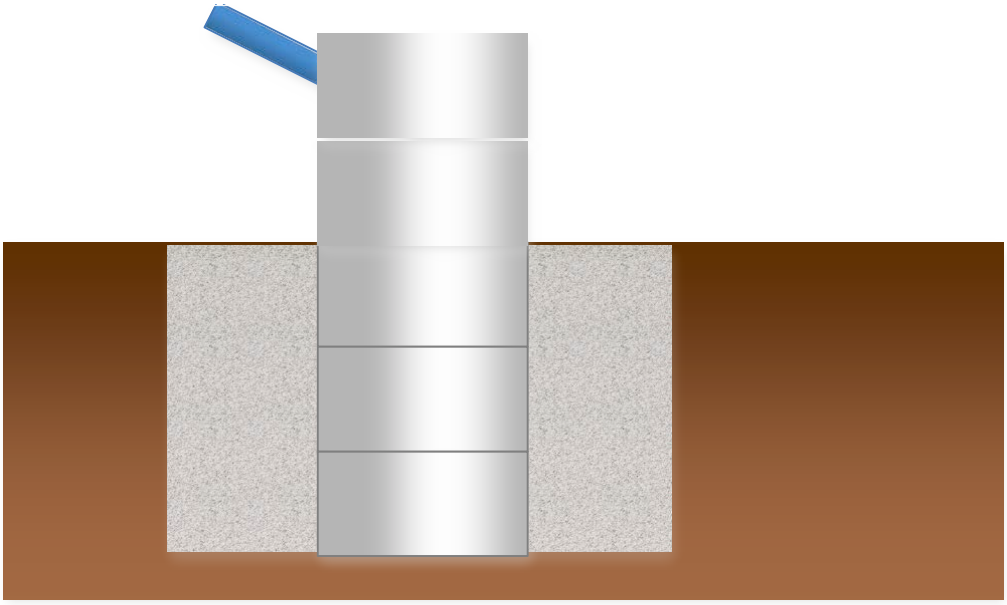


Figure 10: Technical design for moderate flooding

Figure 11: Costs of the two designs for moderate flooding

Both proposed solutions were analyzed through the HCD lenses of desirability, feasibility, and viability. While potentially technically feasible, the research and insights indicated that the designs showed very low desirability and thus low viability. The extra construction and associated costs are not perceived as necessary and hold little value. The lower cost and ease at which unsanitary solutions (e.g. releasing the waste into flood waters) address user needs makes introducing higher cost sanitary options a challenge. It is extremely difficult to sell users what they believe they do not need. If either of the proposed solutions are to be taken forward in the market, significant work will need to be done to change user perceptions accompanied with significant subsidy.

Figure 13 below summarizes the product development process and key decision points.

Build and Test

Four prototypes were built in September 2012—two for moderate flood design, and two for severe flood design. The prototypes were built in Svay Rieng province.

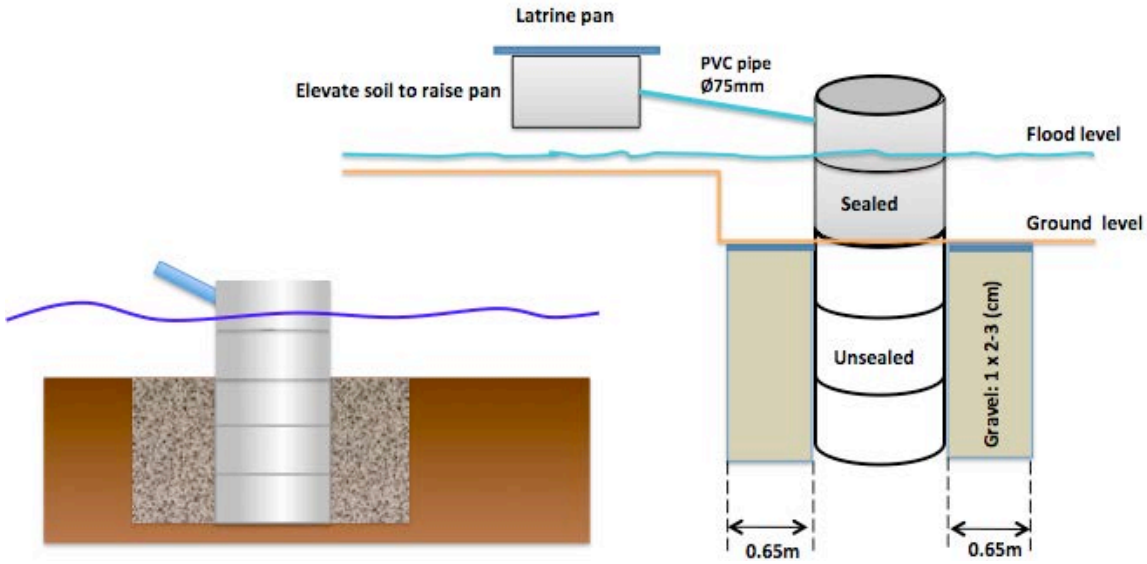


Figure 12: Left, moderate flood design prototype; Right, severe flood design prototype

Results of the field tests encountered challenges with basic functionality, inhibiting the extent to which the filtration functionality could be tested, as the PVC pipes were clogged. Ultimately, users testing the prototypes express that it is too expensive for them to ever consider actually paying for such a system.

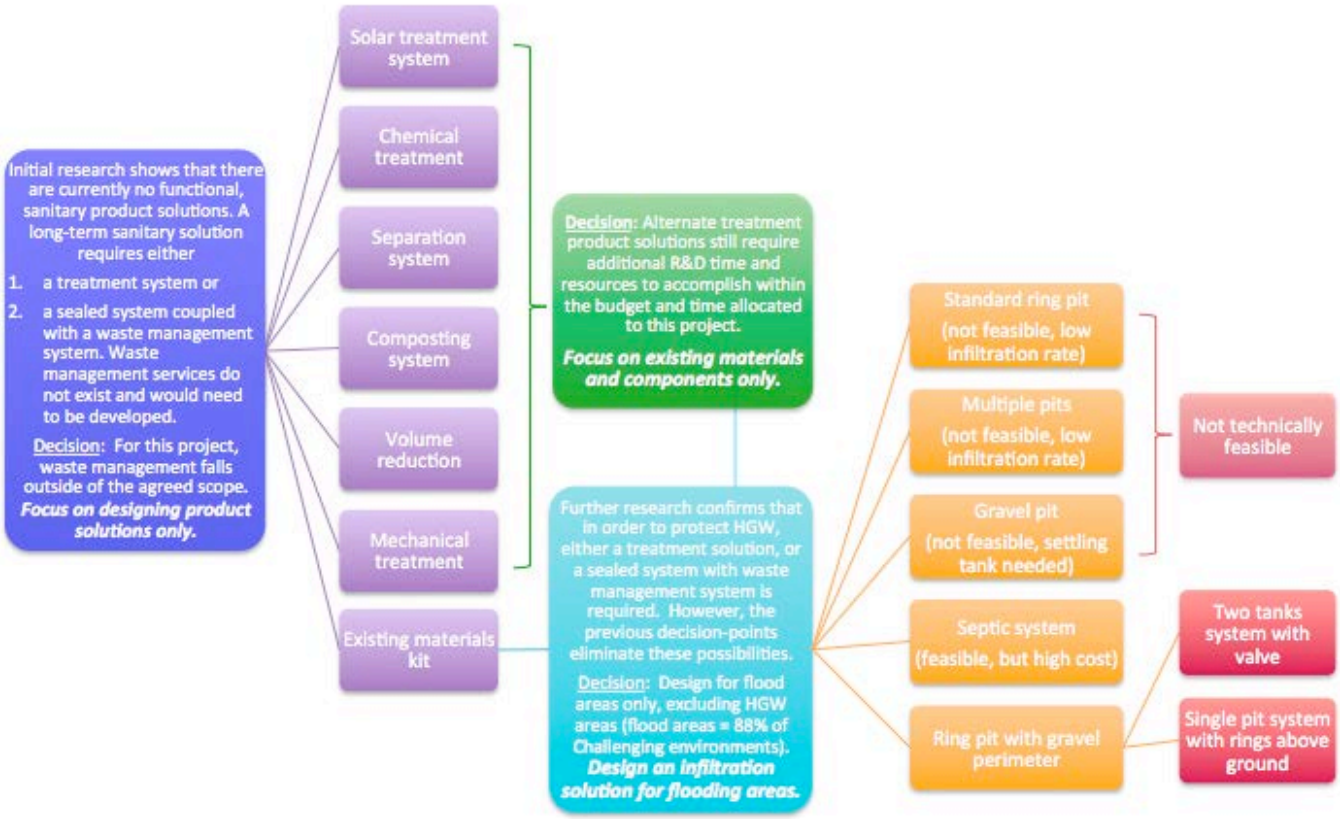


Figure 13: Summary of design process and decision points

4 Final SMSU Results: Introduction and Methodology

4.1 Introduction

This section of the report summarizes findings from the SMSU monitoring and evaluation efforts from September 2011 – October 2014. These results inform ongoing program decision-making and also provide the basis for determining whether the project met the key targets set in partnership with the Bill & Melinda Gates Foundation, Stone Family Foundation, and Water and Sanitation Program of the World Bank.

The report outlines the methods used to collect and analyze data and provides the key findings related to each of the project targets, organized around the themes of coverage and use, sales and business development. For project results related specifically to Going Deep, please see the final Going Deep End of Program report.

4.2 Methods

4.2.1 Overview of methods

The key indicators of success for this project are:

1. Sales through project-connected enterprises
2. Sales to poor households through project-connected enterprises
3. Sales through non-project-connected enterprises in project areas
4. Sales through non-project-connected enterprises outside project areas
5. Increase in latrine coverage
6. Consistent use by adults (self-reported)

In order to measure these results, the following methods were used:

- Bi-weekly collection of sales data from project-connected enterprises (measures direct sales)
- Ongoing verification of latrine-business sales (including a household questionnaire to identify the percentage of poor customers, consistent use by adults and installation rate)
- An annual latrine count to estimate changes in coverage at district level and calculate sales through other non-project-connected enterprises in project areas.
- A quarterly business profile update, collecting key business data from each active latrine business

4.2.2 Changes to methods during the project period

Based on Year 1 experience, the project modified its approach for tracking key indicators by:

- Adding additional villages to the latrine count in order to increase the precision of coverage estimates

- Following the same latrine count villages from baseline in order to minimize sampling error over time (the original plan had been to draw a new random sample of villages per district in each round)
- Developing a more robust sales data verification protocol, with much higher sample size.
- Linking the household survey to the verification process instead of the latrine count, in order to better estimate outcomes related specifically to SMSU customers.

The following sections provide more detail on the methods.

4.2.3 Latrine Count

The project conducted the final latrine count between June and September, using a cluster sample method, following up on a subset of 15 villages within each district of the seven SMSU provinces. The sample villages are the same ones used in the Year 2 survey, which added 5 randomly selected villages in each district to the 10 originally sampled at baseline. Within each cluster (village) a census of households was conducted to establish the total latrine count. Staff research assistants (RAs) worked with local leadership to draw a sketch map of the village, identifying the location of all households. The RA visited each household to record the following data:

- IDPoor status (1/2/none)
- latrine type (wet/dry/none)
- installed (y/n)
- whether the latrine was subsidized (y/n)
- if no latrine, whether households shared a latrine with anyone else

Overall, the final latrine count collected data from 199,501 households in 855 villages in 57 districts of 7 provinces. Note that there is one significant change from the baseline. A new district (Por Reang) was created in Prey Veng province, taking parts of the existing Kampong Leav and Pea Reang districts.

Table 9: Latrine count sample profile

PROVINCE	DISTRICTS	COMMUNES	VILLAGES	HOUSEHOLDS
Banteay Meanchey	7	49	105	22,616
Kampong Thom	7	56	105	22,445
Kandal	10	85	150	45,161
Oddar Meanchey	4	18	60	11,069
Prey Veng	12	91	180	45,597
Siem Reap	11	71	165	35,459
Svay Rieng	6	52	90	17,154
Grand Total	57	422	855	199,501

RAs collected household data using paper forms, which were field checked and further validated by the M&E Manager. Data entry clerks entered the data. The SMSU M&E Coordinator conducted field verification of latrine count data.

iDE's M&E Manager and global Director of Performance Measurement (iQ) conducted the analysis using a combination of R and Excel.

4.2.4 Sales Tracking

The project's team of research assistants collects sales data from each project-connected latrine business every two weeks. Latrine businesses maintain a record book to track customer data (name, phone number, village/commune/district/province) and details of the sale (units purchased, components, sales agent responsible, etc.) Research assistants record summary data on deliveries based on the record book and also take a digital photo which they send to headquarters for verification purposes.

Research assistants do field verification of sales data, based on a sample of transactions randomly selected from the latrine business record book. To-date, verification of sales has been happening 6-12 months after the transaction date. This allows the project to track 6-month installation rate and usage.

Earlier in the project, there were issues with completeness of data in the latrine business record book. This is to be expected with the introduction of a new process and with so many new latrine businesses coming online. More recently, in order to tighten the verification process, management clarified that iDE staff supporting the latrine businesses would not receive their sales incentives for sales that did not have proper client identification (i.e. were non-verifiable). This, along with increased latrine business familiarity and comfort with the record book, has contributed to an improvement in the completeness of data.

4.2.5 Household Survey

As noted above, the strategy for the household survey was modified. In the first two survey rounds, the survey were conducted in tandem with the latrine count. Thus, the sample was broadly representative of latrine owners, but did not provide specific information on SMSU customers. For the purposes of this project, the household survey has been shifted to link with the sales verification exercise. Thus, the sampling frame is SMSU customers. This allows for a better estimate of project-specific installation rates and the percentage of sales to poor households (those identified as IDPoor 1 or 2 in the Government of Cambodia's wealth ranking system). The new verification process samples 35 customers from each LBO (that had at least 35 sales in the reporting period). iDE research assistants interview 20 of the customers with a longer questionnaire that asks for details on installation (materials used, type of shelter, etc.), financing, IDPoor status, use, and customer satisfaction with the product and with the supplier. 15 households receive the "short form" survey, which only asks about installation (yes/no or in process), IDPoor status and use.

4.2.6 Latrine Business Profile Update

Every quarter, RAs collected a set of business data from latrine businesses. These data included information on staffing, pricing, inventory, capital investments and financing. The purpose of this exercise is to build up a picture over time of the businesses providing toilets, provide a descriptive analysis of market dynamics and identify determinants of business success or failure. Data from this exercise, combined with sales data, support the business analysis in this report.

5 Coverage

5.1 SMSU Milestones and Survey Findings

Key Milestone	Baseline		To Sep 30, 2012	To Sep 30, 2013	To Sep 30, 2014	Notes
41% total latrine coverage in target districts	29%	Target	NA	NA	41%	Provincial levels show high variability – especially in dry latrine coverage. These figures are for wet latrine only.
		Actual	32%	37%	45%	

As shown in the table above, improved (pour-flush) latrine coverage in the seven provinces stands at 45%, up substantially from 29% at baseline in February 2012.[25] This is a significant jump of 16% (Student's t-test $p<0.0001$) in coverage over a relatively short period of time (essentially 2.5 years from baseline to endline). This represents roughly 173,000 new latrine installations across the seven provinces. Approximately 83,000 of those installations are estimated to be from SMSU partner business sales (while the direct sales for the project overall were over 140,000, estimated installations by the end of August 2014 are based on installation data from the sales verification surveys. See the section on installation for more details).

Figure 14: Percentage of population with a pour-flush latrine: across the seven SMSU provinces.

[25] Note that the estimates here for baseline and year 1 are slightly lower than in the Year 1 report. Previously, all latrines were counted, including those not yet installed. The current protocol – more in line with standard practice – is to count only installed units.

5.2 Coverage by Province

As shown in Figure 15, there was considerable variation in both baseline and endline coverage across provinces. Three provinces ended up with coverage above the 41% target, although Kandal was already above this threshold at baseline. Although they fell short of the 41% goal, both Prey Veng and Siem Reap more than doubled toilet coverage over the project period, having started below 20%.

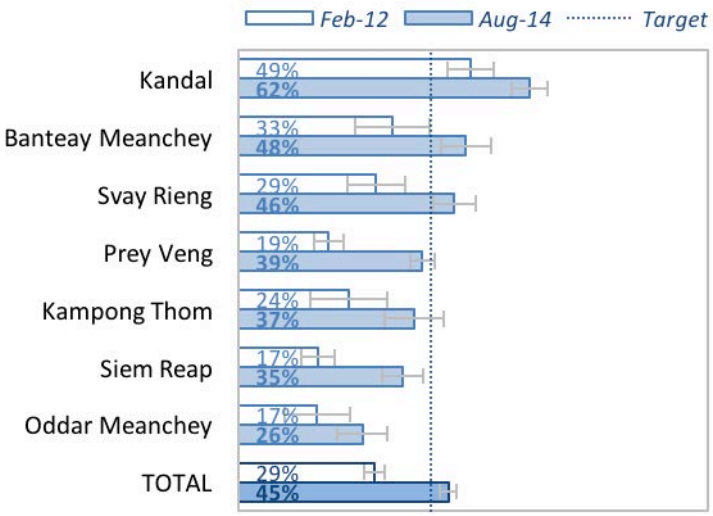


Figure 15: Percentage of population with a private pour-flush latrine, by province: Feb 2012 and Aug 2014 (ordered by endline coverage)

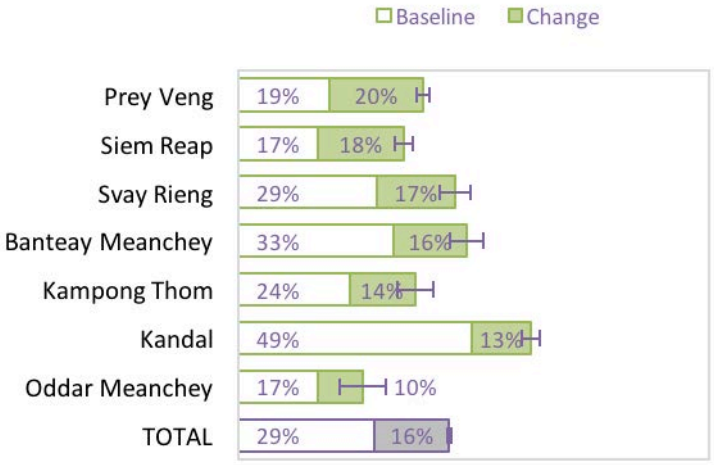


Figure 16: Change in improved latrine coverage by province: Feb 2012 – Aug 2014

(ordered by magnitude of change)

5.3 Coverage by District

27 of 56 districts[26] had coverage above 41%. Of these 17 were not already above 41% at baseline. As shown in Figure 17, many districts, while still below the 41% threshold at endline, saw large increases in coverage proportional to the baseline situation.

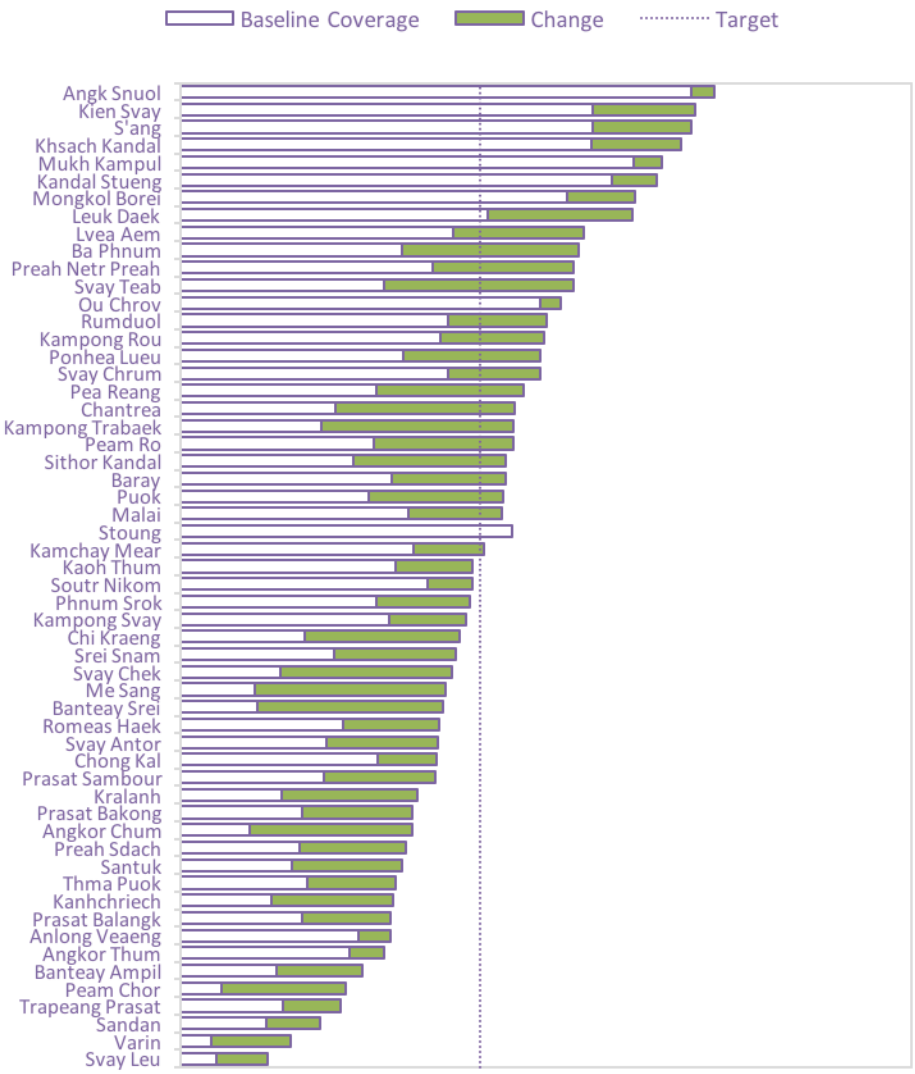


Figure 17: Change in improved latrine coverage by district: Feb 2012 – Aug 2014 (ordered by endline coverage)

[26] In Prey Veng, a new district (Por Reang) was created from part of Pea Reang and Kampong Leav (urban) districts. The project has no baseline data for Por Reang and thus only analyse 56 districts in the pre-post analysis.

5.4 IDPoor Coverage

Figure 18 shows the distribution of IDPoor coverage across provinces. Overall, there has been a doubling (12% increase) in IDPoor coverage since the baseline in early 2012. There is a high degree of variation between provinces. Most notable are the more than twofold increase in Kandal, Banteay Meanchey and Prey Veng. Kandal is one of the "Going Deep" provinces, where iDE and PATH – with technical support from the World Bank Water and Sanitation Program – were piloting financing to increase latrine sales and penetration in the IDPoor market segment. Randomized trials of financing indicated a very significant (four-fold) increase in willingness-to-pay at current market prices. There was no significant bias toward poor customers in the finance trials – the increase in sales appeared to be evenly distributed among poor and non-poor customers. Prey Veng has also been the focus of sanitation finance activity.

However, the other "Going Deep" province – Svay Rieng – did not see a significant increase in IDPoor coverage. Oddar Meanchey actually had a modest (although statistically insignificant) decrease. We should note that both of these provinces saw reclassification of IDPoor households over the project period, which in both cases reduced by 25% the number of households classed as IDPoor.

Our hypothesis is that reclassification tends to exert a downward influence on measured coverage. Following reclassification, households still classed as IDPoor are likely to have been closer to the bottom of the wealth distribution and thus less likely to have had a toilet than those reclassified as non-poor and thus removed from the category in future latrine counts. Because the project did not retain individual household identifiers in the latrine count datasets, we are unable to reconstruct the original IDPoor cohort and can only reflect the coverage among those still classed as IDPoor at the time of the survey.

The other province that experienced a significant reclassification during the project period was Siem Reap, where 19% of IDPoor households were reclassified as non-poor. While this may cause us to underestimate the true change in coverage, the pre-post data still indicate a doubling in IDPoor coverage – albeit from a very low 7% up to 14%.

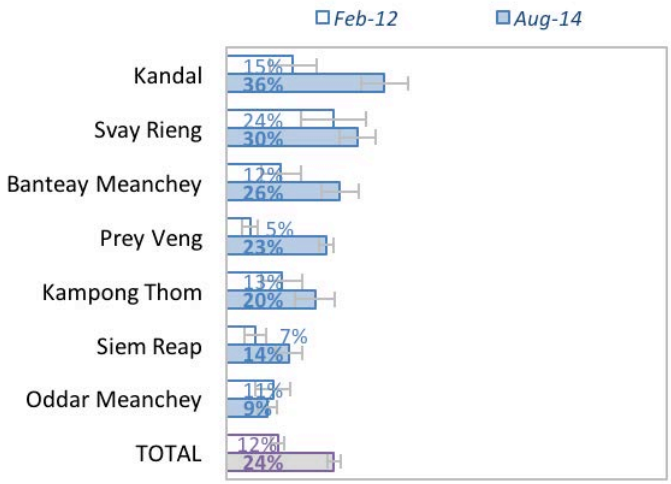


Figure 18: Percentage of IDPoor households with an installed latrine, by province: Feb 2012 – Aug 2014 (ordered by endline coverage)

5.5 Abandonment

Overall, the prevalence of abandoned latrines noted in the survey was very low. 0.2% of households had abandoned their latrine. Among the provinces, Oddar Meanchey and Kampong Thom had the highest prevalence of abandoned latrines – 0.8% and 0.7% of households surveyed respectively. This is likely a conservative estimate as it is likely that enumerators missed cases of abandoned latrines. However, the numbers may indicate that the issue of abandonment is not as significant as previously thought. Also to note, because the latrine count took place during the rainy season, latrines that were temporarily out of commission due to flooding were not considered "abandoned" for the sake of this analysis.

5.6 Sharing

The latrine count also asked households without a latrine if they shared facilities with a neighbour. Overall, 4% of non-latrine-owners indicated that they did share a neighbour's latrine. Kandal had by far the highest proportion of households sharing latrines: 19% of non-latrine-owners said they shared a neighbour's facility.

Table 10: Proportion of non-latrine-owners who share a latrine with a neighbour (Aug 2014)

PROVINCE	% SHARING
Kandal	19%
Svay Rieng	11%
Kampong Thom	8%
Banteay Meanchey	6%
Prey Veng	6%
Siem Reap	3%
Oddar Meanchey	1%
TOTAL	**4%**

6 Sales

6.1 SMSU Milestones and Survey Findings

Key Milestone		To Sep 30, 2012	To Sep 30, 2013	To Oct 31, 2014*	TOTAL	Notes
70,000 latrines purchased from project-connected enterprises	T	14,000	21,000	35,000	70,000	Exceeded Excellent Target
	A	13,992	47,114	79,924	141,030	
45,000 latrines purchased in target districts from enterprises not connected to the project	T	9,000	13,500	22,500	45,000	Estimated using overall coverage change and estimated SMSU installations
	A	26,888	33,222	30,028	90,138	
30,000 latrines purchased outside of iDE target districts through the activities of other organizations influenced by the project.	T	NA	NA	30,000	30,000	
	A	0	0	52	52	
10,500 latrines purchased by poor households from project-connected enterprises and/or through project-connected finance mechanisms	T	2,100	3,150	5,250	10,500	Overall proportion of IDPoor sales is 21.6%
	A	2,819	10,208	17,165	30,191	

**The project period was extended to Oct 31, 2014*

6.2 Project-connected enterprises

As shown in Figure 19, project-connected enterprises cumulatively sold over 141,000 latrines by the end of October 2014. This exceeds the "excellent" target of 140,000 latrines, and is the result of nearly 80,000 latrine sales in the final year of the project (actually 13 months, with average unit sales of over 6,000 per month). Figure 20 shows monthly sales. There is a seasonal dip during the peak rainy months of July – September and the festivals in October/November. The seasonal pattern is somewhat obscured by the rapid growth that occurred over the course of the project. The peak sales month to-date was March 2014, when the team recorded over 10,000 sales for the first time. As further described in the business analysis, sanitation teachers (sales agents) have played an increasing role in driving sales and the team the strong growth in 2014 in large part to a stronger focus on sanitation teacher organization and effectiveness.

Figure 19: Cumulative project-connected latrine sales – All provinces Oct 2011-Oct 2014

Figure 20: Monthly project-connected latrine sales - All provinces Oct 2011-Oct 2014

6.3 Non-project-connected sales

Part of the motivation to improve the precision of latrine count estimates in 2013 was to better calculate the number of non-project-connected sales in project areas. By increasing the number of villages surveyed and by returning to the cohort of villages sampled at baseline, the project is confident that the estimates of the change in coverage are much more accurate between baseline and the second follow-up latrine count.

The latrine count takes approximately 3 months to complete in its entirety. The baseline effort centered around February 2012, while the second and third follow-up surveys centered around August 2013 and 2014 respectively. Thus, estimated increases in overall numbers of latrines to SMSU sales are related during that same period.

The approach to estimating non-project-connected sales was revised, using project collected installation data. Previously, SMSU sales data was subtracted from the estimates of total latrines (installed and uninstalled) from the latrine counts. However, there were concerns that the estimates of uninstalled latrines were not as reliable as the estimates of installed latrines (it is easy to miss a household with an uninstalled latrine). Using project data on installation (see the section on installation later in this report) the number of project-connected latrines installed at any given time were modeled. This allows for comparison of the estimated number of installed project-connected latrines with the change in overall installations to calculate the number of non-project-connected sales.

Table below summarizes the estimated number of SMSU installations (from SMSU sales and installation data) and the number of non-project-connected sales (calculated based on latrine count data).

PROVINCE	NEW INSTALLATIONS	SMSU INSTALLATIONS	NON-SMSU INSTALLATIONS	RATIO
Banteay Meanchey	19,836	11,584	8,252	0.7
Kampong Thom	19,099	15,491	3,608	0.2
Kandal	33,072	5,490	27,581	5.0
Oddar Meanchey	5,480	4,019	1,461	0.4
Prey Veng	48,276	23,568	24,708	1.0
Siem Reap	28,863	11,497	17,366	1.5
Svay Rieng	18,610	11,449	7,161	0.6
TOTAL	**173,236**	**83,098**	**90,138**	**1.1**

Table 12: Project-connected and non-project-connected installations: Feb 2012-Aug 2014

The overall ratio of non-project-connected sales to project-connected sales is roughly 1:1. However, it is clear from the table that there is substantial variation from province to province. In Kandal, there is a high level of non-project latrine sales, whereas in Oddar Meanchey and Kampong Thom, there is very little activity outside of SMSU-connected businesses.

Taken in isolation, estimates of indirect sales are subject to a range of interpretations. We present and discuss some of those interpretations here:

1. **SMSU stimulation of broader market activity:** One interpretation is that indirect sales represent a "ripple effect"; that is, broader market activity stimulated as a result of generalized marketing campaigns and local shifts in attitudes and behavior brought about directly through SMSU investments in marketing, sales and business capacity building. In this sense, the hope would be to see a leading effect, where SMSU sales are initially a higher percentage of sales in a ramp-up of overall sales activity, followed by a decrease in SMSU market share as other businesses crowd in and capitalize on innovations in product and marketing strategy, as well as overall shifts in consumer attitudes and behavior.

2. **Broader market shifts influencing SMSU success:** It is also possible that SMSU is more successful in areas where other external factors are already driving sales. Without randomizing SMSU activities to certain areas, it is impossible to know with a high degree of confidence the direction of effect: whether SMSU is driving market shifts per the previous point, or whether SMSU is opportunistically riding a wave of rising sales stimulated by other campaigns (CLTS, subsidy, public awareness, etc.). It will be interesting to see whether the significant gains in coverage across SMSU provinces are matched by other non-SMSU provinces. In order to do this analysis, we must wait for the next round of national statistics on rural sanitation coverage.
3. **Indirect sales simply reflect the "market share" of SMSU with little causative effect:** One could argue that a larger % of indirect sales simply reflect a smaller market share for SMSU (SMSU just happens to be a smaller player in the context of other private or public sector initiatives). In this case, it would be expected to see little relationship between SMSU market share and overall coverage gains, as SMSU is just mopping up sales that would have happened anyway.

Overall, it is clear that, absent systematic data on other non-project activities such as targeted subsidy, public awareness campaigns, and CLTS initiatives, it will be difficult for us to draw strong conclusions from indirect sales data.

6.4 Analysis of coverage change versus SMSU sales

One approach to analysis of available data on SMSU sales and coverage changes is to create a metric of "SMSU intensity" in an area and test the degree to which this intensity varies with actual changes in coverage in that area (if there is no relationship between SMSU sales and coverage changes, one should expect no significant slope to a regression of SMSU intensity and coverage change). One metric of intensity is the number of SMSU direct sales in an area. However, comparing the absolute number of direct sales with estimated number of new latrines can be confounded by the relative size of the area (both SMSU sales and overall sales should be higher in areas with larger population, even if there is no causal relationship between SMSU and overall coverage). Calculating SMSU sales as a % of the area population thus gives us a better measure of "intensity". Regressions of coverage change on sales as % of area population were run, both in villages of Kandal and Svay Rieng and in districts across all SMSU areas.

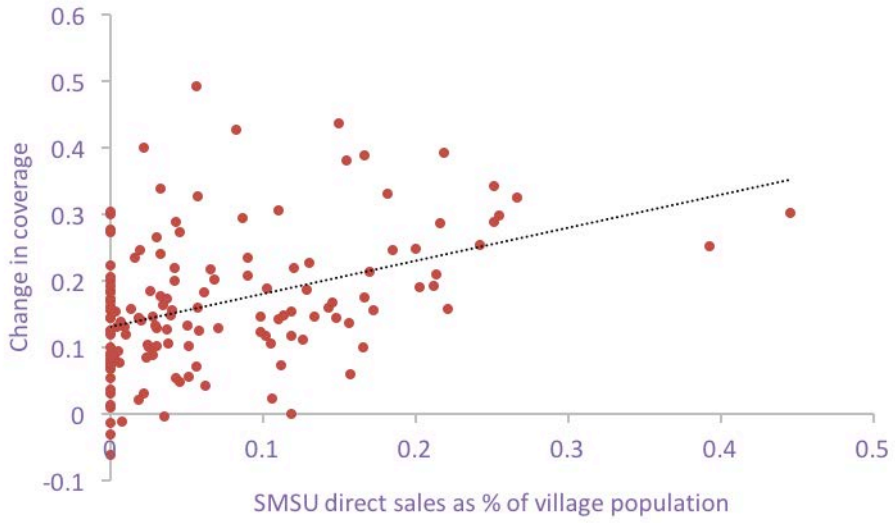


Figure 21: Distribution of coverage change as a function of SMSU direct sales (% of village population). (coeff: 0.34, R^2=0.15, p<0.001)

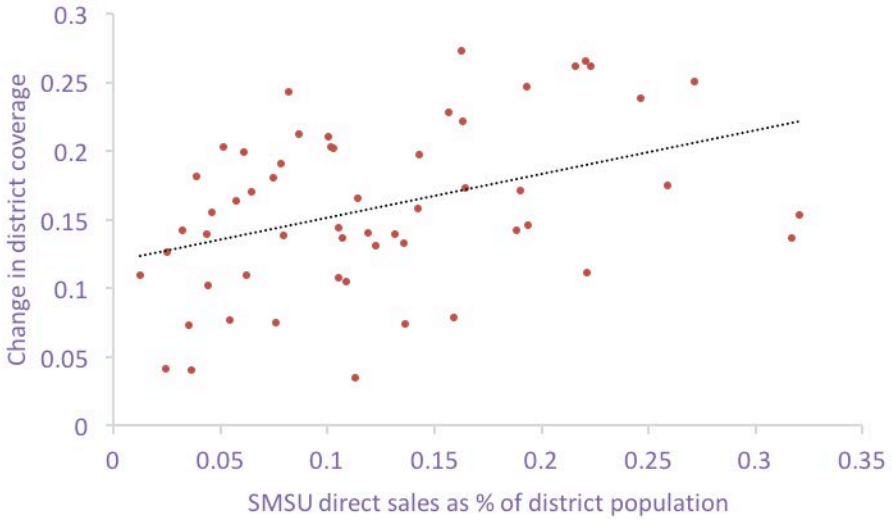


Figure 22: Distribution of coverage change as a function of SMSU direct sales (% of district population). (coeff: 0.32, R^2=0.14, p<0.01)

Both regressions yield significant positive slopes but there is a fair bit of noise – especially at district level. As is apparent from the plots, there are a number of villages with low SMSU intensity (sales per population) but still achieving relatively large increases in coverage.

Building on the discussion of interpreting indirect sales and changes in coverage relative to SMSU activity, these regressions show a positive relationship between SMSU activity and coverage change, which discounts the third hypothesis (that there is no relationship; that SMSU sales are simply replacing sales that would have happened in any case through other channels in areas where SMSU has chosen to operate). However, these results do not tell us whether SMSU sales are causing overall coverage increases or instead are caused by other factors that are driving high rates of sale (i.e. that SMSU sales are high in areas with higher coverage changes because those are areas that are more conducive to sales).

6.5 Purchases by poor households

One of the key questions for the project is the degree to which market development activities penetrate poorer market segments. The willingness-to-pay research feeds into this learning, as does the piloting of financing mechanisms to reduce cash flow constraints for households wanting to purchase a latrine.

From the outset, the project has not included IDPoor status in the ongoing sales data collection. This would require latrine businesses and sanitation teachers to record the IDPoor status of each person purchasing a latrine. This places an undue – and not particularly value-adding – burden of work on businesses. To the extent that businesses do not see value in the information, they would have little incentive to ensure the data are particularly accurate in any case.

For that reason, the project began to conduct field verification surveys to verify sales data and collect IDPoor status data. A two-stage sample design was used, where stratification of latrine business was done in the first stage, and randomly selected latrine sales in the second stage. RAs carried out surveys on a rolling basis, collecting a set number of household surveys and a set number of short-form verifications each month for a year. This accomplished two things: first, it reduces the cost and time burden on the RAs responsible for data collection; second, it allows for more accurately estimating a latrine installation curve.

For each province, the proportion of IDPoor was calculated (weighted for each selected business' total sales) and multiplied by total project-connected sales in the province to estimate total sales to IDPoor. Table 11 presents the results of this exercise. Overall, 22% of SMSU customers were classified as IDPoor. This equates to roughly 30,000 IDPoor sales to-date, well in excess of the satisfactory target of 10,400, but shy of the 'excellent' target of 42,000.

Svay Rieng stands out as having a very low proportion of IDPoor customers relative to the other provinces. This is all the more surprising, given that Svay Rieng was one of the "Going Deep" provinces that had a particular focus on penetrating the IDPoor market.

Table 11: IDPoor Households, By Province

PROVINCE	VERIFIED SALES	% IDPOOR	ESTIMATED IDPOOR SALES
Banteay Meanchey	299	23%	4,899
Kampong Thom	350	23%	5,735
Kandal	440	24%	2,505
Oddar Meanchey	176	30%	2,104
Prey Veng	622	23%	9,767
Siem Reap	340	22%	3,671
Svay Rieng	311	8%	1,510
TOTAL	**2,538**	**22%**	**30,191**

It is illuminating to look at the government's IDPoor statistics for each province and see where iDE is succeeding and where the project fell short in terms of tapping the IDPoor market. Figure 23 presents a bar chart for the SMSU sales breakdown of IDPoor 1 and IDPoor 2 sales alongside the total population breakdown of IDPoor status. In addition to the figure presented, the difference in percentage between these two shows that there are many places where iDE can better serve the IDPoor market. Of course, some of these differences are inflated because there are households in our sample that claimed to have an IDPoor card, but did not know which level they were.

According to the sales figures from the verification survey, the project significantly undersold to IDPoor households in Svay Rieng. In Kandal, however, the percentage of IDPoor 1 customers that businesses have sold to is about 1% higher than the proportion in the total population.

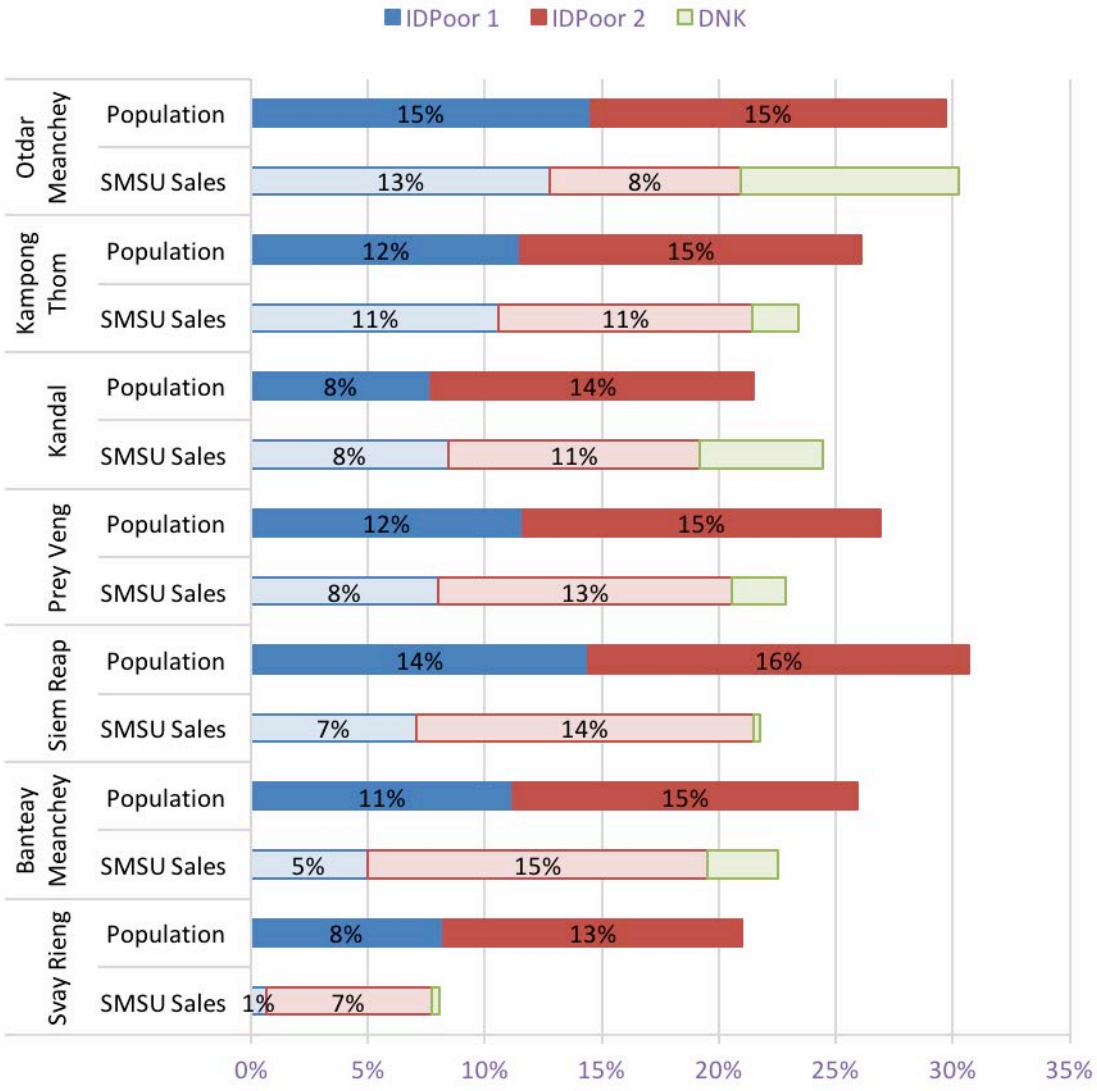


Figure 23: Proportion of IDPoor reached by SMSU compared to proportion in the population

Moving forward, iDE is designing a 'smart subsidy' pilot to test ways to increase coverage among the lowest-income households without distorting the market. As part of this data collection, respondents were asked whether or not they received a full or partial subsidy for the purchase of their toilet. In total, 1.9% of households received a full subsidy and 19% of households received a partial subsidy for the purchase of their latrine. The provinces that had the highest percentage of partial subsidies were Prey Veng, Siem Riep and Otdar Meanchey with 23%, 35% and 13%, respectively.

7 Installation and Use

There were no explicit targets for installation in SMSU, but this is obviously a precursor to usage, which is an explicit SMSU target.

As part of the verification protocol, the project has been checking on the installation of project-connected latrines within a 6-12 month window after sales. On the basis of this analysis, overall 62% of latrines have been installed by 6-12 months post-purchase. The latrine count indicated that there were larger numbers of uninstalled latrines in Kampong Thom and Oddar Meanchey. This is borne out by the figures from the sales verification. This also indicates that we expect a lag between increases in sales through SMSU and corresponding measured increases in coverage.

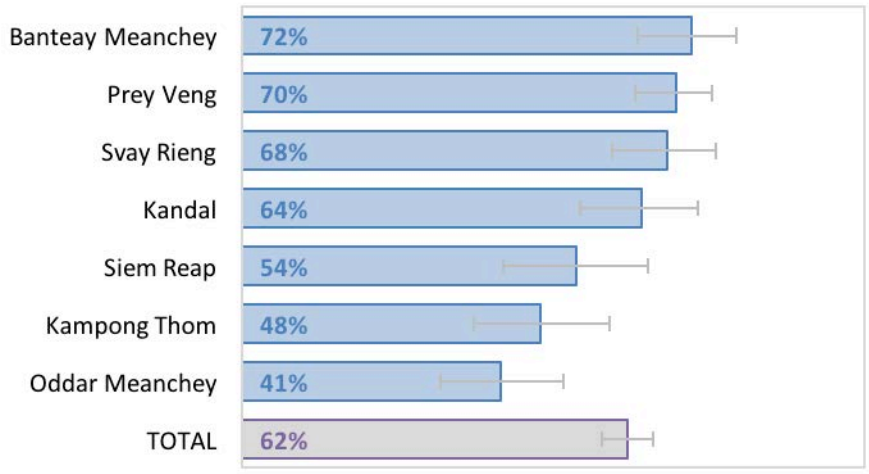


Figure 24: Percentage of purchased latrines installed 6-12 months post-purchase

When installed latrines and latrines being installed are combined into a single binary variable indicating install, statistically significant differences are found between provinces and that Kampong Thom and Oddar Meanchey have significantly lower installation rates than the other provinces[27]. Interestingly, if observations from Kampong

[27] A one-way analysis of variance (ANOVA) was calculated on the proportion of latrines that are installed or currently being installed. The analysis was significant, $F(9, 2576) = 16.56$, $p = 0.035$. Scheffe multiple-comparison tests were used to test for pairwise differences between each of the provinces and show that Kampong Thom and Oddar Meanchey have lower installations than the other provinces.

Thom and Oddar Meanchey are excluded from our estimates, over 70% of the remaining latrines are classified as either installed or being installed.

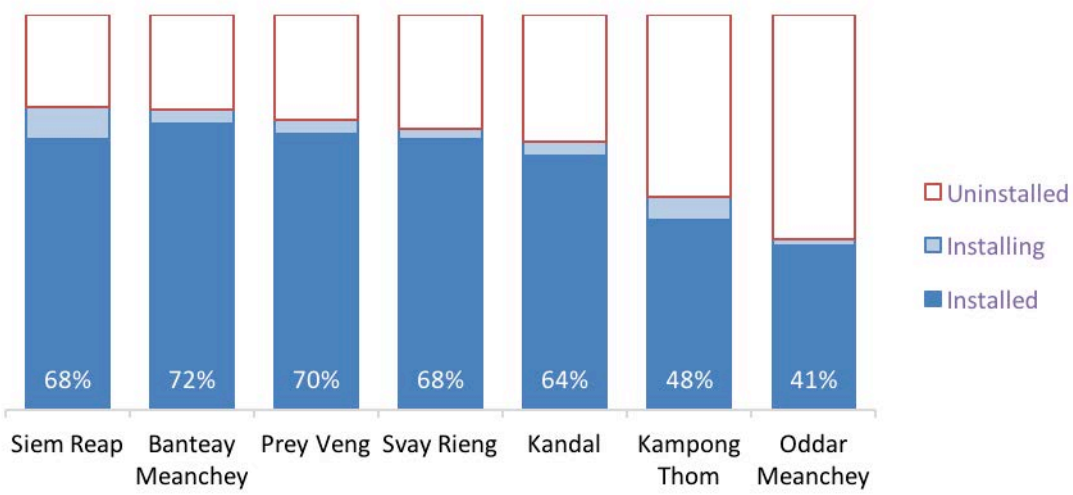


Figure 25: Installed, Installing and Uninstalled Latrines, by Province

Lastly, the project investigated whether or not lower-income households are more or less likely to install their toilet, and whether or not receiving a full or partial subsidy had an effect. Statistically significant differences were found between IDPoor 1, IDPoor 2 and Non-IDPoor in terms of percentage of installed latrines.[28] As one would expect, a slightly lower percentage of IDPoor households were found to have an installed latrine when compared to Non-IDPoor households, but the difference between IDPoor 1 and IDPoor 2 households is not significant. The households that received a full subsidy had a significantly higher proportion of latrines installed (81%) compared to those that received partial subsidy (65%) or no subsidy (67%). See Table 12.

Table 12: Latrine Installation Status, By IDPoor Status

TOILET STATUS	IDPOOR 1	IDPOOR 2	NON-IDPOOR
Not Installed	44.1%	40.1%	31.4%
Installing	5.9%	4.1%	4.1%
Installed	50.0%	55.8%	64.5%

Of course, looking only at the total number of installed latrines could be oversimplifying the result, because there are a number of households in the sample that have only had a latrine for a short period of time and may not have had the time and/or capital to install the latrine yet. With this in mind, a series of latrine installation curves

[28] Difference between IDPoor 1 and Non-IDPoor is significant at 1% and the difference between IDPoor 2 and Non-IDPoor is significant at 5%.

were created to see how quickly, or slowly, people install their latrine. These were constructed by estimating the number of days between initial purchase and installation (or start of installation for those latrines classified as being installed). Looking at Figure 26, the majority (36%) of the total 68% of latrines that are installed are installed in the first month after purchase. The rate of cumulative latrines being installed starts to really diminish after about 3 months, which means that iDE either needs to ensure that latrine purchases are followed up within the first 3 months after purchase or additional action needs to be taken for uninstalled latrines that have been purchased more than three months prior because it is increasingly less likely that they will be installed.[29]

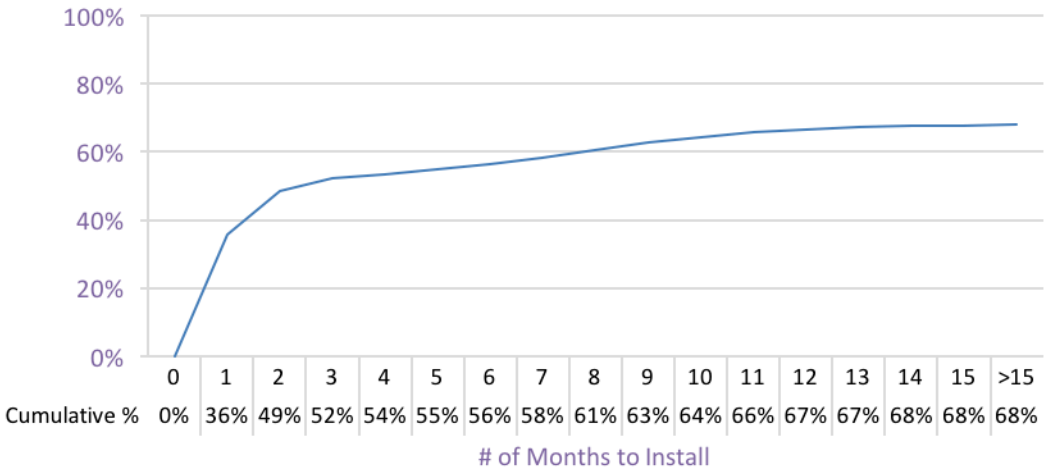


Figure 26: Cumulative Percent of Installed Latrines, by Time from purchase to Installation

In addition, the project was interested to know if IDPoor households follow the same trajectory when compared to non-IDPoor households. Figure 27 shows the total cumulative installations with reference to the total number of installed latrines for the IDPoor Classification and it seems as though the IDPoor 1 and IDPoor 2 households take longer to install, but as shown in Figure 28, which has been normalized to correct for the difference in proportion of latrines being installed within each IDPoor classification, the three groups follow a very similar trajectory.

[29] For each of the latrine curves shown in the section, only those installations containing a valid purchase date and installation date were used. This is the reason why there are minor discrepencies between the total percent of latrines installed in the previous sections, and where the curve maxes out in these figures.

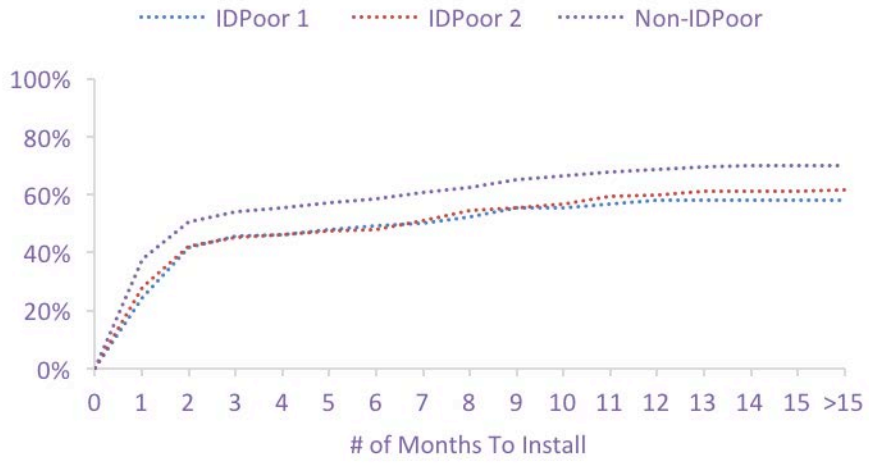


Figure 27: Percentage of Total Installations, by IDPoor Status and Time to Installation

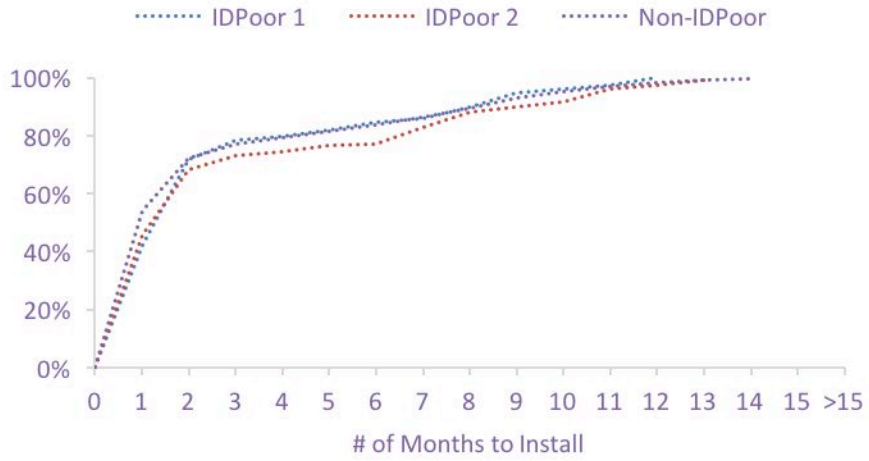


Figure 28: Standardized Percentage Installations, by IDPoor Status and Time to Installation

7.1 Financing

In total, 37.8% of households used financing to purchase their latrine. When looking at each province specifically, it was found that there are significant differences between financed purchases, with Kandal having the most (60%) and Svay Rieng having the fewest (14%). Stratifying by IDPoor status, 54% and 52% of IDPoor 1 and IDPoor 2 households used financing to purchase their latrine, respectively. But only 33% of non-IDPoor households used financing to purchase their latrine. Of those that did use financing to pay for their latrine

between 25-37% of households would be willing to use a similar loan product to purchase other household goods, such as small-scale solar tech, cook-stone or water filter.

7.2 Latrine Type and Shelter Details

The most common type of latrine that households have purchased is an off-set pit latrine that is lined with one to two pits and a tiled slab. Concrete and galvanized steel are the most common materials used for shelter walls, and steel is the most popular material for shelter roofing. For percentages see Figure 29.

7.3 Cost

In order to calculate total cost for the latrine, the project needed to find out whether the household paid for the latrine and shelter at the same time or separately. Once this information was obtained it was proceeded through all of the various ways that the household could have purchased the latrine (i.e., labor included, self-install, shelter and pit labor paid for at once, pit and shelter labor paid for separately, etc.). The average full price paid by the household for a latrine, shelter and installation is between $287-355. There was some variation in the total price that households had to pay across the provinces. See Figure for a summary of the total prices paid in each province.

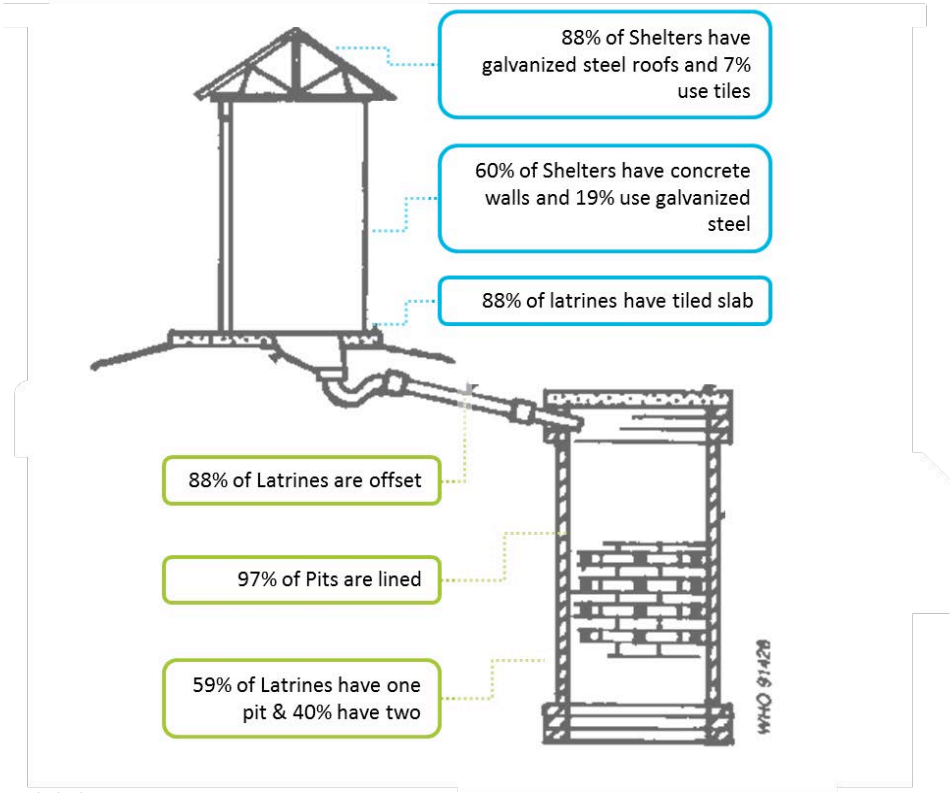


Figure 29: Latrine and Shelter Type

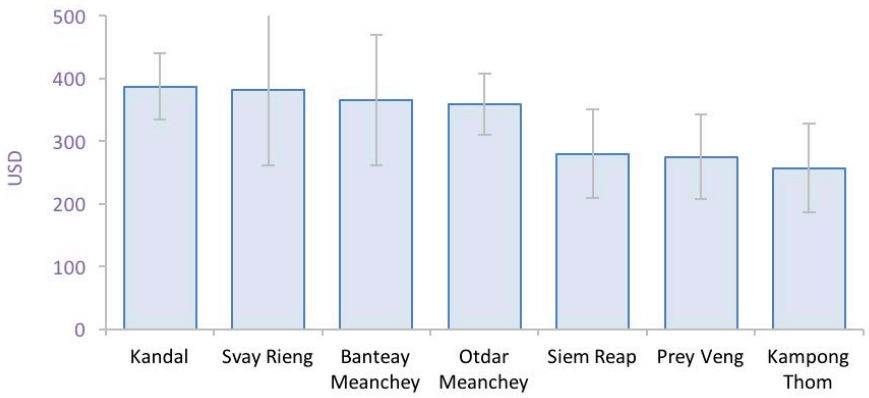


Figure 30: Total Price of Latrine, Shelter and Labor, by Province

LATRINE AND SHELTER PURCHASE	PURCHASE	AVERAGE COST	STD. ERR	LOWER	UPPER
Together	Latrine + Shelter + Installation all at once	344.06	21.07	302.02	386.10
	Latrine + Shelter without Installation	229.70	25.89	178.05	281.36
Separate	Pit and Slab Materials with Labor	59.54	7.81	43.90	75.17
	Pit and Slab without Labor	51.81	2.08	47.64	55.97
	Shelter Materials with Labor	257.10	24.53	208.01	306.19
	Shelter Materials without Labor	154.74	26.44	101.84	207.65
	Labor for pit and shelter	77.70	8.93	59.58	95.82
	Labor for pit	30.06	9.37	10.30	49.82
	Labor for shelter	56.03	7.26	40.93	71.14

Table 13: Latrine, Shelter and Labor Average Prices

7.4 Reported Use

The questions pertaining to the household member's use of the latrine for distinct age groups were only included in the long form Household Survey. The short-form survey asked whether the respondent uses the latrine for defecation, but did not ask about other household members. It should be noted that the questions included pertaining to use rely on self-reported usage, and there is reason to believe that the usage rates are overstated. iDE is currently undertaking an additional data collection to estimate usage rates with the households that completed a randomized bidding game used to estimate willingness to pay for latrines. For the purposes of this additional data collection, reported usage rates are collected and are verifying them with observed proxy indicators associated with use (i.e., pathways leading to latrine, reported odors, observable fecal matter, wet floor, etc.). The aim with this auxiliary research is to first assess what the relationship is between demand for latrine, as measured by bidding game and purchase price, and installation/usage rates of the purchased latrine. A side benefit, however, is that we are able to ascertain whether or not reported usage rates are confirmed by observed usage proxies.

The results from the short-form survey do support the question related to adult usage on the long-form survey where for both the short form and long form, 97% of respondents claim to use their latrine always or almost always. The usage rates for children and for infants are much lower than for adults. Only about 22% of households use their latrine to dispose of infant feces. See figure below:

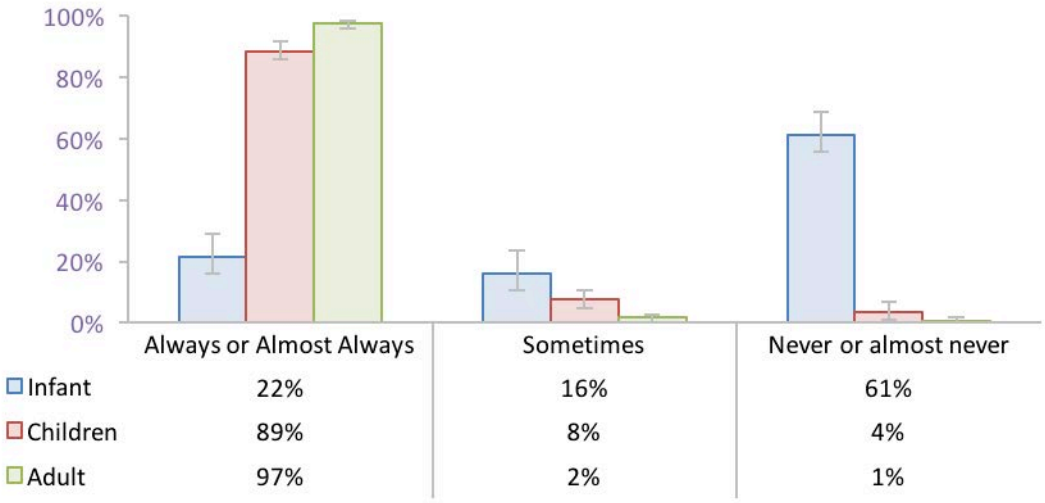


Figure 30: Usage rates, by age group

When looking at the reported usage rates for IDPoor households and compared them to non-IDPoor households, no significant differences were found, except for reported adult use, which has been summarized in Table 14.

IDPOOR STATUS	NEVER OR ALMOST NEVER	SOMETIMES	ALWAYS OR ALMOST ALWAYS	DO NOT KNOW
IDPoor 1	2%	8%	90%	0%
IDPoor 2	0%	4%	96%	0%
Non-IDPoor	1%	1%	98%	0%
Do not know	0%	0%	100%	0%

Table 14: Self-reported use rates for Adults, by IDPoor Status

This result would suggest that IDPoor households may need some additional input regarding behavior change and consistent usage of the latrine. Additional research is required to ascertain why this is the case, and if it there is some limiting factor or income effect that IDPoor 1 households are facing once they have installed their latrine, or if it really is a behavior change problem.

7.5 Customer Satisfaction

The project collected information on the customer's satisfaction with the product itself as well as the supplier. Across all 7 provinces it was found that between 26-39% of customers were very satisfied with the latrine and that 48-61% were mostly satisfied with the product. See

PROVINCE	VERY SATISFIED	MOSTLY SATISFIED	NIETHER	UNSATISFIED	VERY UNSATISFIED
Banteay Meanchey	42%	38%	18%	3%	0%
Kampong Thom	60%	27%	8%	3%	0%
Kandal	16%	75%	5%	4%	0%
Otdar Meanchey	75%	22%	3%	0%	0%
Prey Veng	24%	60%	14%	1%	0%
Siem Reap	25%	64%	11%	0%	0%
Svay Rieng	36%	49%	13%	2%	0%

Table 15 for a breakdown of customer satisfaction by province.

PROVINCE	VERY SATISFIED	MOSTLY SATISFIED	NIETHER	UNSATISFIED	VERY UNSATISFIED
Banteay Meanchey	42%	38%	18%	3%	0%
Kampong Thom	60%	27%	8%	3%	0%
Kandal	16%	75%	5%	4%	0%
Otdar Meanchey	75%	22%	3%	0%	0%
Prey Veng	24%	60%	14%	1%	0%
Siem Reap	25%	64%	11%	0%	0%
Svay Rieng	36%	49%	13%	2%	0%

Table 15: Customer Satisfaction with Latrine Product, by Province

Slightly lower levels of satisfaction were observed for the service side, with only 15% being very satisfied and 66% of households being mostly satisfied. We find that Oddar Meanchey has the highest satisfaction levels for both products and service.

PROVINCE	VERY SATISFIED	MOSTLY SATISFIED	NIETHER	UNSATISFIED	VERY UNSATISFIED
Banteay Meanchey	14%	52%	25%	8%	0%
Kampong Thom	26%	44%	18%	3%	0%
Kandal	16%	75%	7%	1%	0%
Otdar Meanchey	57%	21%	16%	6%	0%
Prey Veng	6%	73%	18%	2%	1%
Siem Reap	1%	93%	4%	3%	0%
Svay Rieng	13%	71%	9%	4%	2%

Table 16: Customer Satisfaction with Service, by Province

8 Business Analysis

8.1 Snapshot of partner latrine businesses (LBOs)

8.1.1 INDICATOR	8.1.2 VALUE		8.1.3 NARRATIVE
Total number of LBOs	329		Includes all the LBOs that the project engaged, regardless of their current status
Total number of sanitation teachers	473		These are sales agents involved with the LBOs who actively help the LBOs in making sales since they receive a commission for every successful sale
Number of Active LBOs	138		Active LBOs are those who have made a sale in the past 6 months (as of Oct 2014). Currently, 42% of the LBOs are active.
Number of Inactive LBOs	191		
Number of LBOs selling through STs	198		Over the course of the project, the strategy shifted increasingly to sales through sanitation teachers.
LBOs from the current active group who are making a profit	90%		Most of the active LBOs are currently making a profit since they have reached breakeven
Average cost of production of a latrine unit	$36		This includes labour, materials, commission and transport cost
Average selling price of a latrine unit	$51		This is derived by averaging the unit sale price of the seven provinces
Estimated operating profit ratio of a typical LBO per quarter	0.26		Roughly, an LBO makes 26 cents of profit for every dollar of sale
Average monthly volume of sale of	ALL SALES	ST SALES	
Highest tier performers (Quintile 5)	72	41	Average monthly unit sales by top 20% LBOs; analysis by all sales and ST sales only
Mid-tier performers (Quintile 3)	13	8	Average monthly unit sales by middle 20% LBOs; analysis by all sales and ST sales only
Lowest tier performers (Quintile 1)	2	1	Average monthly unit sales by bottom 20% LBOs; analysis by all sales and ST sales only
Average monthly revenue of	ALL	ST	
Highest tier performers (Quintile 5)	$3904	$2094	Net sales or revenue (units sold times unit sale price) earned every month by the three groups; analysis by all sales and ST sales only
Mid tier performers(Quintile 3)	$614	$391	
Lowest tier performers (Quintile 1)	$87	$55	
Average monthly net profit of	ALL	ST	
Highest tier performers (Quintile 5)	$1323	$619	Average net profit (gross revenue minus cost of goods sold) earned every month by the three groups; analysis by all sales and ST sales only
Mid tier performers(Quintile 3)	$157	$108	
Lowest tier performers (Quintile 1)	$ 22	$15	

8.2 Key Insights

8.2.1 Being an LBO is generally profitable

The sales data and revenue suggest that the sanitation business is profitable. Out of the 329 LBOs the project has worked with, 246 LBOs (75%) achieved breakeven with their latrine sales, which bodes well for the latrine business in general, since the next stage is turning a profit. Currently, 90% of active latrine businesses are profitable.

8.2.2 A significant portion of the currently inactive LBOs were quite successful while active

In general, there have been a large number of 'dropouts'. 191 of the 329 LBOs engaged by iDE (58%) are no longer active. Even though it appears that the sanitation business is generally profitable, that profit potential alone may not be a strong enough incentive to continue with the business. In fact, approximately 30% of the inactive LBOs were considered 'high potential LBOs' before they dropped out. They had a good sales record, had achieved breakeven, and had become quite profitable before deciding to discontinue their latrine sales. Qualitative research data from the field suggest possible reasons for this:

- Latrine sales are seasonal. In many cases, sales peak twice a year: after the Cambodian New Year in April and after harvest season (this varies depending on the region). Some LBOs are only interested in producing heavily at those times, focusing on other more profitable activities during the rest of the year.
- Some LBOs were supported through subsidized sales, usually through a NGO run project, where sales are guaranteed at a fixed (generally high) sale price. Once the subsidy project is over, LBOs find it difficult to turn a profit without the subsidy, which often leads to the discontinuation of sales to focus on other business activities.
- Some LBOs may be at the point in their business growth where they have found other, possibly more sustainable sources of consistent cash income (i.e. diversifying their portfolio with multi-season products/services). SMSU's value to the LBOs is that latrine sales provided them with consistent, easy access to cash. Once LBOs find new mechanisms to replace this, the value of continuing latrine sales begins to diminish.

8.2.3 Active involvement of Sanitation Teachers brings about more sales and may predict latrine business sustainability

The data strongly indicate that sanitation teachers are often the driving force behind high sales. LBOs with the highest monthly unit sales have the highest number of STs actively involved per month, while LBOs with lower sales tend to have very few or no active STs. Most of the active LBOs (94%) are working through STs, while only a small percentage of inactive LBOs (around 34%) have ever worked with an ST. It could very well be that when the challenge of closing sales is managed by the STs, LBOs have more confidence about continuing in this line of business.

8.2.4 High unit sales do not necessarily predict high returns, especially on a monthly basis

In a number of instances, it took LBOs many months or even years to reach significant levels of cumulative sales. As already noted, some sold only during high periods, while hardly selling anything the rest of the year. In such cases, monthly sales profit tends to be quite low. In some cases, high operating expenses cut into profit

margins, in spite of a large volume of sale. (See Table 6, where we compare rankings of monthly profit versus rankings of total units sold for the top 20 monthly profit earners).

8.3 Cost of Sanitation as a Business

This section details manufacturing and sales costs. Additionally, highlighted are the nature and value of capital investment in the latrine business. Note that recurrent expenditure for sustaining sanitation services are not included, such as operations and maintenance cost, since that falls on the consumer.

8.3.1 Cost of Materials

The cost of basic latrine sets was calculated using average expenses in each of the regions where iDE has worked with LBOs. The table below shows the raw material cost of building a latrine set, all of which reflect 2014 market prices in Cambodia.

Table 17: Average province-wise cost of raw materials for a latrine set

Elements	Unit	Banteay Meanchey	Oddar Meanchey	Siem reap	Kampong Thom	Prey Veng	Kandal	Svay Rieng
Cement	ton	$100.00	$100.00	$96.50	$97.00	$110.00	$98.00	$113.00
Sand	m3	$22.50	$10.00	$10.00	$10.00	$10.00	$8.00	$15.00
Gravel	m3	$20.00	$25.00	$23.50	$24.00	$27.50	$18.00	$27.50
Reinforcement bar 4mm	ton	$1,000	$1,000	$975.00	$800.00	$875.00	$950.00	$950.00
Reinforcement bar 6mm	ton	$1,000	$1,000	$912.50	$700.00	$750.00	$800.00	$950.00
Tile 20*20	box	$5.00	$5.00	$4.88	$5.00	$5.00	$5.00	$6.00
Ceramic pan	pcs	$8.50	$8.50	$8.38	$8.50	$7.50	$8.50	$8.75
PVC pipe	pcs	$5.00	$5.00	$5.00	$4.50	$4.50	$4.50	$5.00

8.3.2 Price Composition and Sale Price

A latrine set typically consists of the following components:

- 3 rings
- pit cover
- slab with ceramic pan
- catchment box
- PVC pipe.

Figure 32 depicts the cost of making of a latrine set, including materials, labour, transport and sales commission, as well as profit. Lacking comprehensive data on transport costs, an average transport cost of 10,000 riel ($2.50) per unit is used as an estimate, which is assumed to be included in the retail price.

Commissions for sales agents (also known as 'sanitation teachers') vary minimally by business, ranging from 4,000 to 20,000 riel($1 to $5) per unit of latrine set sale. The chart below takes the weighted average based on actual commissions paid, divided by total units sold (including commission and non-commission sales, since there are numerous cases where a sale was directly made by an LBO without the involvement of a sanitation teacher).

Figure 31: Price breakdown of a latrine set (including profit)

	Banteay Meanchey	Oddar Meanchey	Siemreap	Kampong Thom	Prey Veng	Kandal	Svay Rieng
Margin	20.39	20.21	20.71	18.86	12.88	8.40	4.59
Commission*	0.93	1.04	0.76	0.76	0.91	1.29	0.56
Transport	2.50	2.50	2.50	2.50	2.50	2.50	2.50
Labour	5.00	6.13	4.77	5.38	4.25	4.38	4.25
Material	30.12	27.22	26.65	27.30	26.91	27.03	29.13

* Weighted average, based on actual commissions paid divided by total unit sales.

Figure 32: Price breakdown of a latrine set (including profit) – ST sales only

	Oddar Meanchey	Banteay Meanchey	Siemreap	Kampong Thom	Prey Veng	Kandal	Svay Rieng
Margin	26.42	23.22	21.36	17.29	13.52	8.89	3.79
Commission*	3.60	2.54	2.34	2.61	2.30	3.58	2.66
Transport	2.50	2.50	2.50	2.50	2.50	2.50	2.50
Labour	6.13	5.00	4.77	5.38	4.25	4.38	4.25
Material	27.17	30.03	26.55	26.78	26.42	27.39	29.53

* Weighted average, based on actual commissions paid divided by total unit sales.

It is interesting to note that there is a $14 difference in margin between the province with the highest average sale price (Banteay Meanchey) and the one with the lowest (Svay Rieng). This spread is larger when looking only at ST sales, with a range of close to $23.

One of the primary reasons for such a variation of margin is the subsidy factor. Various NGOs and project provided significant subsidy in the northern regions (Oddar Meanchey, Siem Reap, Banteay Meanchey). It appears that some level of price distortion resulting from subsidy may have been observed. The latrine price in subsidy projects is not set by free market forces, but rather is mainly based on the agreement between donors and service providers.

8.3.3 Capital Expenditure

LBO investments fall roughly into three categories:

- Raw materials such as cement and stones;
- Larger capital assets such as carts and trucks;
- Productive assets such as ring molds and stands.

Raw materials are already incorporated in the estimate of unit production cost, while LBOs often use the larger capital assets for other businesses that they run parallel to their sanitation business. Thus for calculation of start-up investment and breakeven, we consider primarily the productive asset category.

Items falling under the 'productive assets' category primarily include two types of ring molds: 1m and 80cm, along with molds for pans, bricks, covers, pillars, slabs and catchment/chamber boxes.

On average, capital expenditure per business stands at $934, while the median is $516. So far, there has been no strong, discernable trend between number of quarters spent as an LBO and capital expenditure, since a large portion of the capital expenditure is initial investment within the first few quarters.

8.4 Sales and Revenue

Revenue from sales is the lifeblood of any business. The primary question is whether the business is earning enough to survive and be profitable in the long run.

8.4.1 Distribution of Sales

Total unit sales per LBO ranges from 1 to 4,698. Figure 2 shows the sales distribution (in units) by province, while the percentages represent the number of LBOs in that province (out of the total 329 LBOs). Predictably, the region with the highest percentage of LBOs (Prey Veng) has the most unit sales and vice versa (Oddar Meanchey). However, there are exceptions. Kandal had fewer sales than its 15% share of LBOs might suggest. Conversely, Kampong Thom had more sales, with fewer LBOs. It stands to reason that it is the performance of the individual LBO that counts more than the total number of LBOs in a region.

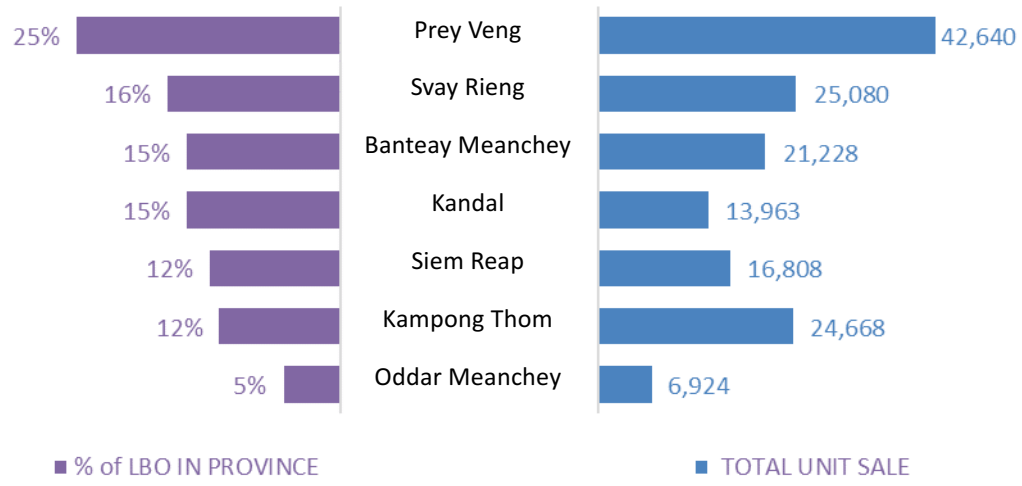


Figure 33: Distribution of LBOs and total unit sales by province

Table 18 shows the average monthly and total unit sale of all the LBOs that iDE has worked with. Since it would not be appropriate to compare the sales figure of an LBO with 2 years in the business to one who has spent only 2 months, the monthly sales figures provides an even platform for comparison. The table ranks the monthly latrine sale of all the LBOs, showing the corresponding total units sold to date, and the period of time spent as an LBO (in quarters). Rows that have been highlighted in green represent those LBOs who are currently active (138 out of 329 LBOs).

Note: When two or more LBOs have the same number of units sold/month, they are ranked equally.

It is evident from the table that a high monthly sale does not necessarily equate to a proportionally high total unit sale or vice versa.

The highest sale per month is the LBO with 265 units sold/month. This LBO has spent only 2 quarters (6 months) in the business, and has a total of 1,589 units sold.

Averaging all the LBOs' monthly sales and business duration, it is estimated that an LBO spends 6 Q (18 months) in the business and sells around 23 units per month. Cells highlighted in red are the three highest figures:

- Highest sales/month: 265 units: En Chhorn is an LBO based in Banteay Meanchey, which experienced heavy subsidies by the Asian Development Bank. Notably, of the three here, he is the only one in the list of the top 20 most profitable business.
- Highest total sales: 4698 units: Duong Setha of Svay Rieng is an original LBO from the Pilot Project. He has experienced some subsidy, but not to the extent of the northern regions. Mr. Setha also had a strong diversification of income streams, including a rubber plantation that allowed him comfortable cash flow.
- Longest business duration: 22 Q (66 months). Nuon Makara, also known as Mr. Riem, is based in Kandal and has engaged with iDE since the Pilot Project. He has not experienced any other subsidy programs, but has been a consistent business owner.

Figure 34 shows a distribution ratio of about 30/80 (31% of LBOs made 80% of sales). The top 10% of LBOs made 45% of sales. 12% of LBOs were responsible for 50% of sales. The top 10 (3% of all) made 20% of sales.

Figure 34: Pareto distribution of sales by LBOs

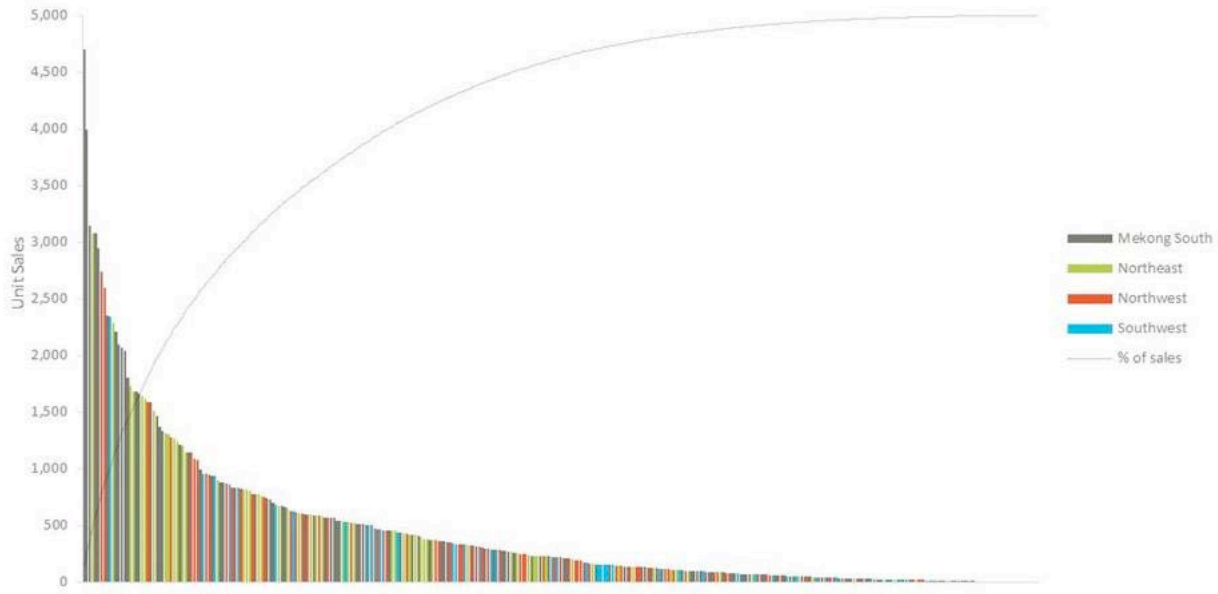


Table 18: Ranking of all partner LBOs by average monthly sales, showing total sales and duration of business to-date (# quarters)

RANK by MNTHLY SALE	AVG. MNTHLY SALES	TOTAL UNIT SALES	Q in BUS-INESS	RANK by MONTHLY SALE	AVG. MNTHLY SALES	TOTAL UNIT SALES	Q in BUS-INESS	RANK by MNTHLY SALE	AVG. MNTHLY SALES	TOTAL UNIT SALES	Q in BUS-INESS
1	265	1,589	2	57	22	457	7	72	7	123	6
2	250	750	1	57	22	130	2	72	7	82	4
3	229	2,744	4	58	21	837	13	72	7	61	3
4	183	1,647	3	58	21	321	5	72	7	281	14
5	171	3,075	6	58	21	1,148	18	73	6	75	4
6	158	948	2	58	21	570	9	73	6	56	3
7	134	1,205	3	58	21	885	14	73	6	93	5
8	105	629	2	58	21	628	10	73	6	74	4
9	102	3,996	13	59	20	839	14	73	6	92	5
10	98	1,471	5	59	20	535	9	73	6	18	1
11	92	828	3	59	20	118	2	73	6	231	13
12	88	1,589	6	59	20	352	6	73	6	159	9
13	85	508	2	60	19	581	10	73	6	35	2
14	82	2,951	12	60	19	116	2	73	6	69	4
15	81	3,145	13	60	19	686	12	73	6	86	5
16	80	1,686	7	60	19	457	8	73	6	34	2
16	80	1,683	7	60	19	457	8	73	6	133	8
17	78	3,075	13	60	19	169	3	73	6	33	2
18	76	2,291	10	61	18	607	11	74	5	32	2
19	75	4,698	21	61	18	702	13	74	5	16	1
20	72	2,597	12	61	18	588	11	74	5	158	10
21	68	1,216	6	61	18	372	7	74	5	60	4
21	68	1,620	8	61	18	477	9	74	5	30	2
22	67	602	3	61	18	210	4	74	5	15	1
23	64	957	5	62	17	522	10	74	5	104	7
23	64	762	4	62	17	512	10	74	5	59	4
24	63	2,067	11	62	17	102	2	74	5	73	5
25	60	180	1	62	17	861	17	74	5	56	4
26	57	2,209	13	63	16	145	3	74	5	82	6
26	57	2,038	12	63	16	433	9	74	5	41	3
27	56	1,668	10	63	16	667	14	74	5	68	5
28	54	653	4	63	16	568	12	75	4	52	4
28	54	1,142	7	63	16	234	5	75	4	52	4
28	54	161	1	64	15	91	2	75	4	13	1
29	52	471	3	64	15	179	4	75	4	13	1
29	52	1,089	7	64	15	221	5	75	4	101	8
29	52	622	4	64	15	441	10	75	4	62	5
29	52	1,237	8	64	15	569	13	75	4	61	5
30	51	613	4	65	14	128	3	75	4	24	2
31	49	1,321	9	65	14	250	6	75	4	83	7
32	48	871	6	65	14	333	8	75	4	47	4
33	47	1,277	9	65	14	455	11	75	4	69	6
34	46	2,354	17	65	14	41	1	75	4	57	5
35	44	1,735	13	65	14	163	4	75	4	100	9
35	44	525	4	66	13	398	10	75	4	22	2
36	43	512	4	66	13	158	4	75	4	43	4
36	43	256	2	66	13	351	9	75	4	42	4
37	42	382	3	66	13	234	6	75	4	21	2
37	42	882	7	66	13	503	13	76	3	41	4
37	42	504	4	66	13	116	3	76	3	141	14
37	42	252	2	66	13	424	11	76	3	90	9
37	42	377	3	66	13	229	6	76	3	50	5
38	40	364	3	66	13	225	6	76	3	29	3
38	40	1,079	9	67	12	334	9	76	3	28	3
38	40	598	5	67	12	111	3	76	3	36	4
38	40	1,304	11	67	12	513	14	76	3	18	2
39	39	234	2	67	12	325	9	76	3	35	4
39	39	2,095	18	67	12	144	4	76	3	35	4
39	39	1,271	11	67	12	107	3	76	3	26	3

40	38	340	3	67	12	282	8	76	3	32	4
40	38	675	6	67	12	70	2	76	3	32	4
41	37	778	7	67	12	139	4	76	3	24	3
42	36	323	3	68	11	137	4	76	3	70	9
42	36	429	4	68	11	136	4	76	3	23	3
42	36	535	5	68	11	367	11	76	3	23	3
42	36	2,341	22	68	11	228	7	76	3	15	2
43	35	423	4	68	11	293	9	77	2	73	10
43	35	105	1	68	11	257	8	77	2	21	3
43	35	416	4	68	11	287	9	77	2	53	8
44	34	1,334	13	68	11	254	8	77	2	26	4
45	33	783	8	68	11	412	13	77	2	13	2
46	32	191	2	69	10	157	5	77	2	13	2
47	32	331	4	69	10	218	7	77	2	37	6
47	32	1,517	16	69	10	152	5	77	2	12	2
48	31	942	10	69	10	151	5	77	2	34	6
48	31	464	5	69	10	571	19	77	2	11	2
49	30	457	5	69	10	300	10	77	2	27	5
49	30	731	8	69	10	90	3	77	2	16	3
49	30	272	3	69	10	293	10	77	2	15	3
50	29	782	9	69	10	230	8	77	2	10	2
50	29	955	11	69	10	114	4	77	2	24	5
50	29	1,803	21	69	10	57	2	77	2	23	5
51	28	673	8	70	9	142	5	78	1	17	4
51	28	587	7	70	9	197	7	78	1	4	1
51	28	744	9	70	9	140	5	78	1	29	8
52	27	1,144	14	70	9	84	3	78	1	18	5
52	27	319	4	70	9	334	12	78	1	10	3
53	26	542	7	70	9	303	11	78	1	12	4
53	26	154	2	70	9	244	9	78	1	21	8
53	26	998	13	70	9	81	3	78	1	13	5
54	25	902	12	70	9	27	1	78	1	10	4
54	25	374	5	70	9	342	13	78	1	5	2
54	25	817	11	70	9	128	5	78	1	5	2
54	25	222	3	70	9	51	2	78	1	8	4
54	25	813	11	71	8	101	4	78	1	6	3
54	25	590	8	71	8	100	4	78	1	6	3
54	25	295	4	71	8	99	4	78	1	4	2
54	25	442	6	71	8	216	9	78	1	5	3
55	24	943	13	71	8	71	3	78	1	6	4
55	24	361	5	71	8	47	2	78	1	6	4
56	23	210	3	71	8	207	9	78	1	3	2
56	23	839	12	71	8	23	1	79	0.3	4	4
56	23	137	2	71	8	91	4	79	0.3	2	2
56	23	546	8	72	7	110	5	79	0.3	1	1
56	23	811	12	72	7	43	2	79	0.3	3	4
57	22	604	9	72	7	191	9	79	0.3	3	4
57	22	266	4	72	7	63	3	80	0.2	2	3
57	22	529	8	72	7	42	2	80	0.2	1	2
57	22	329	5	72	7	124	6	81	0.1	1	3
57	22	1,373	21	72	7	288	14				

8.4.2 Revenue and Profit

In order to assess LBO performance in terms of revenue and profitability, LBOs were divided into quintiles based on monthly sales.

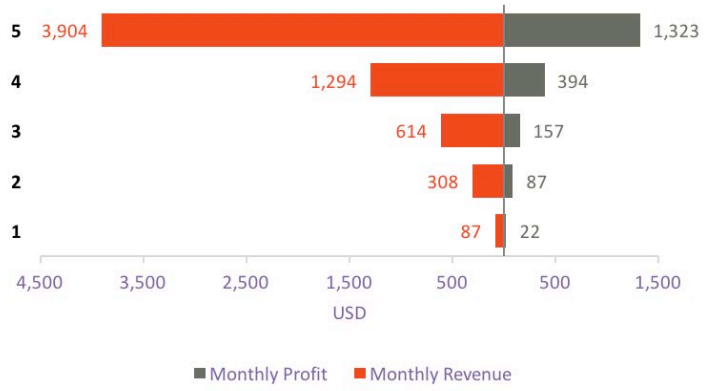


Figure 35: Monthly revenue and profit by quintile

Figure 35 shows the tiered analysis of sales, with monthly revenue and profit. It helps to look at Table 19 to see the average sale price charged at each quintile. The top performing LBOs (who sell around 70 latrines per month) charge the highest sale price, earning total revenues of $3,904 and a monthly profit of $1,323. The bottom performers only have an average profit of $22 (they sell around 2 latrines per month). In the middle (Tier 3) are LBOs who make an average profit of $157 (selling around 13 latrines per month).

Table 19: Unit sale price and latrines sold per month

		QUINTILE				
Variables	Unit	1	2	3	4	5
Unit Sale Price	$	47	50	49	52	52
Latrines Sold/Month	unit	2	6	13	25	72

Table 20 shows the same breakdown but only for ST sales, with LBOs ranked accordingly.

Table 20: Unit sale price and latrines sold per month – ST sales analysis

		QUINTILE				
Variables	Unit	1	2	3	4	5
Unit Sale Price	$	52	51	51	53	52
Latrines Sold/Month	unit	1	4	8	15	41

RANK - MONTHLY PROFIT	LBO	AVERAGE MONTHLY PROFIT (USD)	AVERAGE MONTHLY SALES (Units)	RANK - MONTHLY SALES	TOTAL UNITS SOLD	RANK - TOTAL UNITS SOLD	SOURCE OF Subsidy (if any)
1	Nhoeas Hoeun	10,415	229	*3*	2,744	*7*	ADB
2	Seang Salay	6,397	134	*7*	1,205	*34*	Ketsana
3	Sem Rith	5,882	250	*2*	750	*62*	Ketsana
4	Pov Navy	5,114	158	*6*	948	*43*	Ketsana
5	Chhon Chheat	3,480	92	*11*	828	*54*	CHHRA
6	En Chhorm	3,403	265	*1*	1,589	*22*	ADB
7	Sei Matheng	3,215	183	*4*	1,647	*20*	ADB
8	Chum Chak	2,644	105	*8*	629	*71*	Ketsana
9	Hun Heng	2,529	171	*5*	3,075	*4*	ADB
10	Chea Oun	1,816	52	*29*	622	*72*	CHHRA
11	Luon Vanna	1,710	40	*38*	1,304	*28*	Suon Moliti
12	Kry Seyha	1,591	64	*23*	762	*60*	Suon Moliti
13	Paom Pary	1,588	76	*18*	2,291	*10*	Ketsana
14	Nheb Rithy	1,502	88	*12*	1,589	*22*	Smart Subsidy
15	Chan Ean	1,442	32	*46*	191	*170*	ADB
16	Ream Ny	1,417	80	*16*	1,683	*18*	Smart Subsidy
17	Leng Kimthy	1,352	80	*16*	1,686	*17*	ADB
18	Chea Sinat	1,307	72	*20*	2,597	*7*	Malteser
19	Doem Kong	1,301	49	*31*	1,321	*27*	Ketsana
20	Meas Nuon	1,134	28	*51*	587	*80*	No subsidy

Table 21 shows the top 20 LBOs with the highest financial returns (in terms of monthly profit), and their overall comparative ranking in terms of monthly as well as total units sale (green cells denote active LBOs).

Table 21: Top 20 monthly profit earners

It is remarkable that of the top 20, only one was not selling into a subsidy program. Details on the referenced subsidy programs are as follows:

- Suon Molniti (full subsidy) provides latrines consisting of: 3rings, 1box, 1slab, 1cover, pipes (small and big), and 1 cover. Before providing latrines, Suon Molniti needed Sanitation Teachers to disseminate sanitation awareness to villagers.
- Ketsana (full subsidy) provided latrines consisting of: 3 rings, 1 slab, 1 box, pipes (small and big), and 1 cover.
- ADB (full subsidy) provided latrines consisting of 4 rings, 1 slab, 1 box, 2 pipes (small and big), and 1 cover.
- Malteser (partial subsidy) provided ring molds and other materials to key villagers who were disseminating health awareness in communities.
- CHHRA (Partial subsidy) provided pans, box and ring molds for villagers so that they could make rings by themselves.
- Smart Subsidy (partial subsidy) is provided through government by East Meet West (EMW). The subsidy provides a rebate of USD$17 per latrine for IDPoor households.

8.4.3 Tiered Performance Analysis- Correlation of Performance with External Factors and Trend Analysis

8.4.3.1 Gender

22 out of 329 LBOs (roughly 7%) are women. There is no discernable pattern tying performance to gender. In fact Quintile 1 has the same percentage (1.5%) of female LBOs as does Quintile 5.

8.4.3.2Location

As shown in Table 22, the distribution of LBO performance varies by province. Banteay Meanchey and Kampong Thom appear to have a higher percentage of high-performing LBOs, whereas Svay Rieng and Kandal have higher proportions of lower-performing LBOs. Most of the LBOs in Oddar Meanchey are mid-level performers, whereas Prey Veng and Siem Reap have a fairly even distribution across tiers.

Table 22: Distribution of LBO quintiles by province

		QUINTILE				
Province	Distribution	1	2	3	4	5
Banteay Meanchey		10%	10%	21%	29%	29%
Kampong Thom		11%	8%	21%	29%	32%
Kandal		19%	33%	23%	17%	8%
Oddar Meanchey		11%	22%	44%	6%	17%
Prey Veng		24%	20%	16%	20%	21%
Siem Reap		15%	24%	22%	15%	24%
Svay Rieng		37%	22%	13%	19%	9%

8.4.3.3Financing

108 out of the 329 LBOs (33%) took financing for their business and it is evident that most of the LBOs who took financing fall in the middle or upper quintiles (See Table 23). A larger percentage of the better performing LBOs tend to take loans since they are very much invested in their business, are comfortable with taking risks, and are willing to buy on credit from suppliers.

8.4.3.4LBO Training

191 LBOs (58%) finished all three components (technical, sales and business) of the core training provided by the project. Of the LBOs that completed core training, 46% were in the upper two quintiles for monthly sales, whereas 27% were in the lower two quintiles (see Table 23).

8.4.3.5Parallel Income Source

103 LBOs (around 30%) reported that they have a parallel source of income besides sanitation. This additional income source varies from LBO to LBO, but some of the more common occupations include farming and supplying construction material. Table 23 shows that there is no particular correlation between the additional income source and LBO performance (based on monthly sales).

8.4.3.6Capital Expenditure

In terms of capital expenditure (percentage share in the total capital expenditure for the latrine business) there is some degree of correlation. It is evident that the top performers have invested the most in their business while the bottom quintile performers tend to invest less in capital expenditure. This is understandable since many of the higher quintile LBOs have taken larger loans to finance their business, often to buy equipment and materials.

8.4.3.7Duration of Business

The more successful LBOs have invested more time in their business (21 months on average) while the less successful ones have spent only about 12-15 months. Many of the lower quintile LBOs have become inactive before even lasting a year in the business.

Table 23: Distribution of LBO characteristics across average monthly sales quintile

		Quintile				
Variable	Distribution	1	2	3	4	5
Took a loan		6%	13%	25%	29%	28%
Completed core training		10%	17%	26%	26%	20%
Parallel income source		12%	20%	27%	22%	18%
% of total capital expenditure		10%	13%	22%	21%	33%
Average number of quarters in the latrine business		4	5	7	8	7

8.5 Enabling Environment

This section looks into the specific 'enabling environment' factors for the SMSU project, including analyzing the extent to which access to finance and sales agents play a role in the success of the sanitation business.

8.5.1 Access to Finance

108 of the 329 LBOs (33%) took loans from various sources (banks, MFIs and informal sources) in order to invest in their latrine businesses. In many cases an individual LBO has taken loans from more than one source. 41 took

loans from a bank, 48 from informal sources and 51 from MFIs. 36 of these businesses took financing from multiple sources.

The total loan value comes to $600,957. Figure 5 shows the source of finance by value (USD).

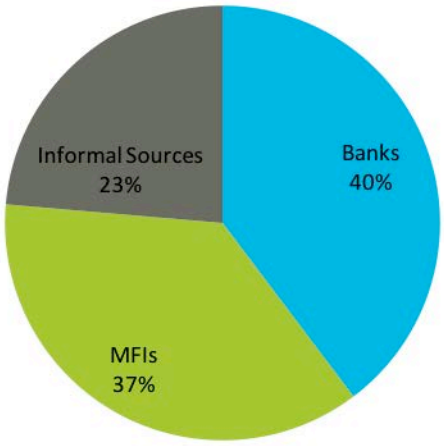


Figure 36: Source of Finance by Value

Additionally, the table below shows the average and median loan size per LBO per source. The median values have been calculated alongside the average ones since for each source there were several extreme values.

Table 24. Average and Median loan size per LBO

	Bank	Informal	MFI
Average value of loan	$ 4,115	$ 2,290	$ 2,020
Median value of loan	$ 2,029	$ 1,000	$ 1,500

8.5.2 Engagement with Sales Agents

The project introduced sales agents called Sanitation Teachers (ST) to professionalize sales.

There is a clear correlation between successful LBOs and involvement of sanitation teachers (see Figure 37). Taking the top and bottom quintiles for example, 6 different STs support a Tier 5 LBO at different stages of the business cycle, while only 1 ST serves a Tier 1 LBO. Since a Sanitation Teacher does not actively engage with an LBO throughout the year, the average active ST/month is not a whole number. (E.g. an ST may work 5 out of the 12 months in a year with a particular LBO- in that case the average active ST per month is 0.4).

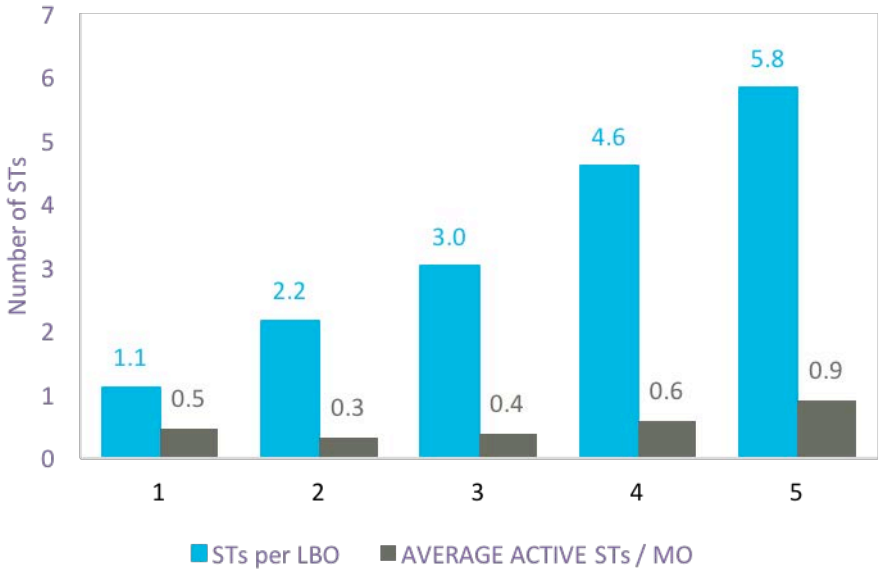


Figure 37: Sanitation Teachers per LBO

Figure 38 goes a step further to show the benefits of having more sales agents involved: there is a dramatic rise in sale.

For example, In Quintile 4, the average monthly sales per active ST is 22 units, and LBOs in that tier have 0.6 STs per month on average (See figure 6). Thus the average sale through ST channel is 22 times 0.6, which is roughly 13 units per month. Thus, 13 out the 25 total monthly units sold in that quintile is through an ST.

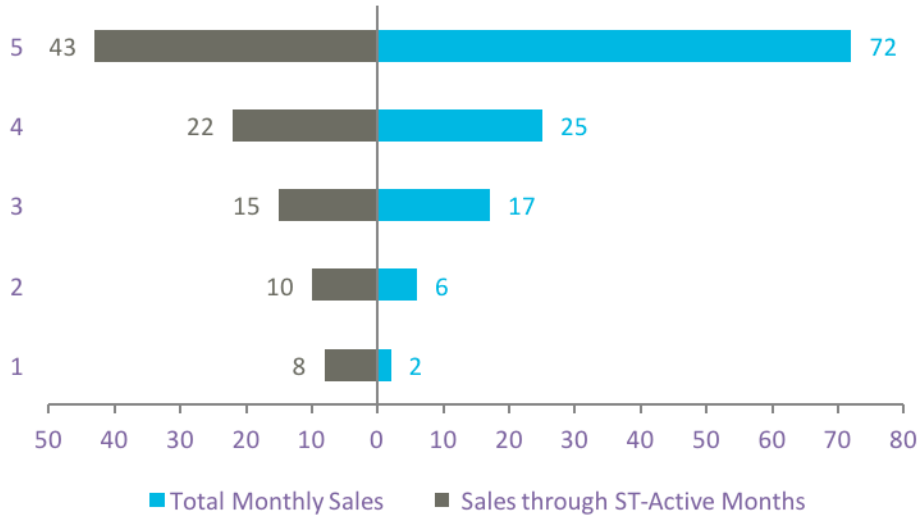


Figure 38: Total monthly sales and sales through STs

8.6 Business Performance Metrics

Financial viability and sustainability of sanitation as a business is measured through the analysis of the LBOs: their profits, sales, expenses and general progress over the quarters since they started working with the project.

8.6.1 Profitability Metrics

In order to get to the profit being generated by a business, both gross margin and operating profit must be calculated.

8.6.1.1 Gross Margin

Gross margin is generally calculated as:

Gross Margin=Net Sales-Cost of Goods Sold

For measuring gross margin per business per quarter Gross Margin = ((Number of latrines sold * sale price of each latrine) - (number of latrines sold* per unit cost of raw material and labour)

The gross margin is important since it measures the first level of profit earned by the LBO.

None of the LBOs (except one whose cost exceeded his revenues) incurred any loss, with the gross margin ranging from a minimum of $4 to a maximum of $32,961 per quarter.

8.6.1.2 Operating Profit

Operating profit = Gross margin - overheads (or operating expenses) - depreciation and interest

Data for depreciation of machinery (which is very challenging to determine in the first place considering the same machinery is used for other purposes) and interest paid on loans have not been collected. Thus these have not been factored in the calculations, and instead of data for overheads, weighted average of commission for Sanitation Teachers and transport costs were included as 'operating expenses'

Thus in this case operating profit is calculated as

Operating profit = Gross margin - (sales commission + transport cost)

This calculation gives the actual profit made by the business, since all the major costs are deducted from it. Whether the profit made is reinvested in the latrine business is another issue that needs to be tackled with in the future.

Most of the LBOs made a profit, ranging from $4 to over $31,246 per quarter.

8.6.1.3 Operating Profit Ratio

Operating profit ratio = operating profit/net sales

This is important since the resulting ratio basically indicates how many cents of profit LBOs generated from every dollar of sales. Table 25 shows the profit generated every quarter, from every dollar of sale. Data from 22 quarters, or 66 months, have been collected.

Table 25: Average operating profit ratio by LBO monthly sales quintile

Quintile	Operating Profit Ratio
1	.23
2	.26
3	.24
4	.28
5	.29

As can be seen, the group of LBOs with the highest monthly sale has 29 cents of profit from every dollar of sale, while those at the bottom make an average of 23 cents of profit per dollar. This analysis would be strengthened by having other industry comparisons or similar businesses to compare to. In table 9, the quarterly progress of operating ratio is shown. Province wise, Siem Reap LBOs have the highest final average ratio of 0.37.

Table 26: Average Operating Profit Ratio by Province

Province	Operating Profit Ratio
Banteay Meanchey	0.33
Kampong Thom	0.33
Kandal	0.19
Oddar Meanchey	0.32
Prey Veng	0.26
Siem Reap	0.37
Svay Rieng	0.11

8.6.2 Financial Efficiency Measures - measuring the latrine business' ability to control cost

8.6.2.1 Operating Expense Ratio

Operating Expense Ratio = Operating Expenses/Net Sales

This ratio, the exact opposite of the operating ratio, indicates the amount of money consuming every dollar of revenue, thus the lower the ratio the better.

The tables below present operating expense ratio by LBO monthly sales quintile and province tables

Table 27: Operating expense ratio by LBO monthly sales quintile

Quintile	Operating Expense Ratio
1	0.77
2	0.74
3	0.76
4	0.72
5	0.71

Table 28: Operating expense ratio by province

Province	Operating Expense Ratio
Banteay Meanchey	0.67
Kampong Thom	0.67
Kandal	0.81
Oddar Meanchey	0.68
Prey Veng	0.74
Siem Reap	0.63
Svay Rieng	0.89

8.7 Sustainability of the LBO Business

While the ratios spell financial success for a large number of the LBOs, sustainability must be viewed through additional lenses. This means looking into other data points and issues, such as: how many LBOs are still actively involved in the business? How many have dropped out of the project and how many have sold off their business altogether? What stands out in the profile of the active versus inactive group? What are the different categories making up the inactive group? How many have reached breakeven?

8.7.1 Reaching the breakeven point

The breakeven point is when a business reaches the point in time where sales cover expenses. It is usually after reaching the breakeven point that a business is considered to have passed the first threshold of sustainability.

So far, 246 out of the total 329 LBOs (75%) have achieved breakeven, which bodes well for the latrine business in general. Of the 198 LBOs with ST sales, 173 (87%) have achieved breakeven.

In the analysis, the breakeven point is calculated in units, using the formula Fixed Costs / (Price – Variable Costs). In some cases, where investment is low, an LBO reaches the breakeven point very quickly while high costs or low profit margin reverse the scenario. Whether measured in units sold or time period (i.e. how long will it take, in months or years, before reaching breakeven point) breakeven period varies from business to business, depending on the LBO's level of capital investment, operating expenses and sales performance.

LBO *Duong Sitha* from Svay Rieng is a Tier 5 performer in terms of monthly sale, with an average of 75 units sold per month. His charges $41 as unit sale price but his margin is very low - only $3.96, and has a very high operating expense ratio: 0.90, which basically means out of every dollar of revenue he makes, 90 cents is the cost of goods sold. Consequently, he had to sell a large number of units (2,068) before he reached the breakeven point. It took him 18 months to reach the breakeven point.

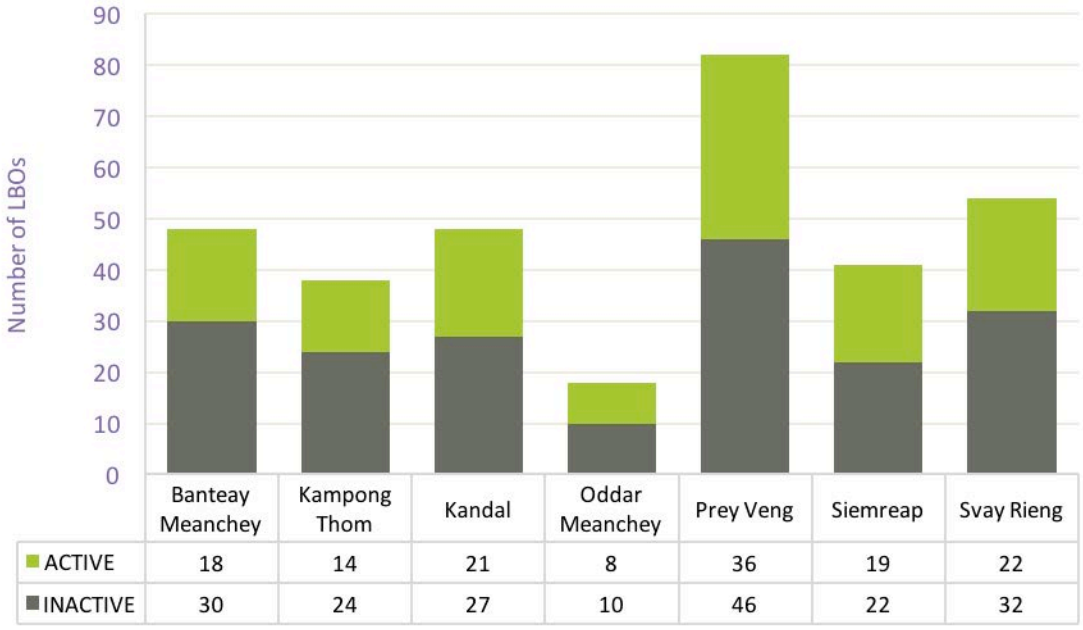
Chan Sokh from Prey Veng is a Tier 2 performer, selling 12 units per month on average. He however sells his latrines at $61/unit, and has a comparatively low operating expense ratio (0.59), resulting in a high margin of $25. He has already reached his breakeven point of selling 51 units. Sokh reached the breakeven point in the first quarter (4 months) of his business, when he sold a total of 56 units.

Bea Sambath (Prey Veng) and *Bob Hing* (Siem Reap) are both Tier 4 performers. They charge similar unit price ($55 and $54 respectively) and have very close margins ($20 and $21). Yet because Sambath sells 30 units on an average, his breakeven point was 19 units while Hing had to sell 60 units before he reached that point.

8.7.2 Current Status of the LBOs

Even after reaching the breakeven point, not all LBOs continue selling. In fact, from among the 246 LBOs who have reached breakeven, only 50% have continued selling to date, while the remaining 50% have opted out. However, this does not mean those who have stopped selling have done so as soon as they reached breakeven. However, it does show that even after turning a profit, many LBOs eventually stop selling.

An 'active' LBO is one who has made a sale in the past 6 months (as of October 2014), while an inactive LBO has no recorded sale in that period. Figure 39 shows the province wise distribution of active and inactive LBOs.



	Banteay Meanchey	Kampong Thom	Kandal	Oddar Meanchey	Prey Veng	Siemreap	Svay Rieng
ACTIVE	18	14	21	8	36	19	22
INACTIVE	30	24	27	10	46	22	32

Figure 39: Province-wise distribution of active and inactive LBOs

Currently, out of the 329 LBOs, 138 (42%) are active while 191 (58%) are inactive.

In fact, revisiting Table 18, it is quite evident that a large number of 'successful' LBOs (businesses with commendable achievement in sales and a high monthly profit) are currently inactive. Thus good sales and high profit margin are not necessarily the right indicators guaranteeing sustainability. Of course, the majority of the inactive LBOs are the ones who have gone out of business due to poor performance in sales. Roughly put, around 30% of the inactive LBOs have been doing very well when they decided to discontinue for various reasons; the remaining 70% have done poorly overall and it made more sense for them to stop and look for some line of business that would be more financially rewarding. Figure 40 provides pictorial evidence of this - showing the number of active and inactive LBOs per quintile. Most of the inactive LBOs can be found in Quintile 1 and 2, where the sales performance is in the lowest range.

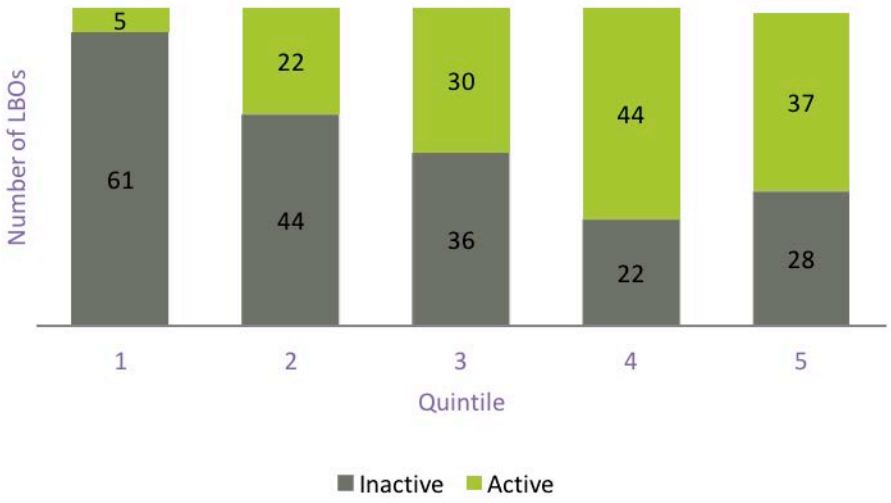


Figure 40: Number of Active and Inactive LBOs by monthly sales quintile

Table 29 summarizes and compares some key characteristics of active and inactive LBOs.

Table 29: Characteristics of Active and Inactive LBOs

Indicator	Unit	Active LBOs	Inactive LBOs
LBOs who have achieved breakeven	%	90	64
LBOs who have completed the core training	%	66	43
LBOs who are involved in other income generating activities parallel to the sanitation business	%	36	28
Tier that most LBOs fall in	Quintile	4	3
Number of quarters LBOs have spent on average spent in this business	Quarter	8.3	4.7
LBOs who have borrowed money for their sanitation business	%	49	21
LBOs with at least one sanitation teacher actively involved in the sale process	%	94	34
Monthly Sales	Unit	30	19

Most of the active group (94%) have at least one sanitation teacher working with them, which seems to be a significant point as STs play a driving role in closing sales. On the other hand, only 34% of the inactive LBOs have worked with STs.

The active and inactive group can be further divided into the categories shown in Figure 41.

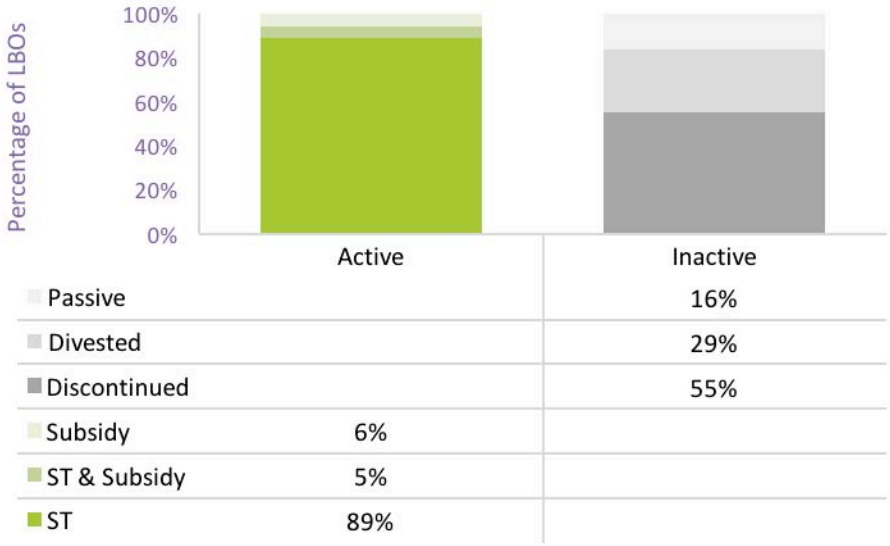


Figure 41: Distribution of LBOs by status sub-category

Most of the inactive group have stopped selling or are 'passively' selling. As seen in the chart, 29% has sold off their latrine business assets (divested). 16% may be passively selling, 55% discontinued, meaning they have dropped off from the project due to various reasons and may or may not be selling latrines.

It is interesting to note that the divested group is the worst off among the three sub categories of inactive LBOs. They fall in the bottom performing group in terms of sale (Quintile 1), only 9% of the divested group had completed the training, 24% had achieved breakeven and their duration in the business is among the shortest.

8.8 Sample Profiles of Successful Businesses

The LBOs highlighted here have met the following criteria:

- Currently active
- Achieved break-even
- Has spent at least a year in the business
- Ranks among the top 20 monthly profit earners

8.8.1 Nhoeas Hoeun

Hoeun, hailing from Svay Chek district of Banteay Meanchey, has been working with the project since August 2013. He has the advantage of being involved with a subsidy project i.e. a large portion of his sales are guaranteed, and at a relatively higher price (as opposed to a non-subsidy sale). He has not attended any of the 3 training components that the project has offered (sales, marketing, technical), and has never worked through a sanitation teacher. So far he has spent one year in the business, and has made a total sale of 2,744 units, which ranks 7th among the total units sold by the 329 LBOs. He has not taken any financing for his business, and has invested around $ 4,180 of his own money in productive assets. On an average, for every dollar of sales he makes 55 cents of profit (i.e. his operating profit ratio is 0.55). His sale price of a latrine set averages around $ 82.86, which is the 4th highest of all sale price, primarily because of the high margin of $46, the second highest of all (margins range from $ 48 to 50 cents when analyzed on an individual basis). In all probability this high margin is part of his arrangement with the subsidy project. His breakeven unit is only 92 (his high unit margin ensured only a small number to be sold before he expenses and earnings became equal), and he achieved that in his first quarter. Hoeun's monthly profit is $10,415 which is the highest among all LBOs.

8.8.2 Chea Oun

Oun is from Oddar Meanchey, working with the project since Oct 2013. He has completed the sales and business component of the training (did not attend the technical one). He has had 9 different STs work with him over the period of one year he has been with the project, with 2.3 STs working with him every month. He has sold 622 units so far (ranking 72), with 360 of those sold through STs. On average, he sells 52 units per month, with a unit margin of $35.

He has invested $115 as in productive assets, and his total loan amounts to $1840, which he borrowed from in parts from an MFI as well as a banking institution. His operating expenses per unit is $37.5, which is relatively low, and combined with his low capital investment, his breakeven point came with the sale of 3 units only.

For every dollar of sale, Oun makes a profit of 48 cents. He earns an average monthly profit $1,816, which is the 10th highest among all LBOs.

8.8.3 Luon Vanna

Based in Siem Reap, Vanna has been involved with SMSU since May 2012. He has completed the full training course. He has worked 2 years 9 months as an LBO, and has made a total sale of 1304 (rank: 28) units, 525 of which were sold through STs. On average, he sells 52 units per month. He has worked with 7 STs so far, with an average of 1.2 STs per month.

His capital expenditure is around $ 1,195 and he charges $76 per unit, $43 of which is his margin. Vanna is quite profitable: he makes 57 cents out of every dollar of sale. His unit operating expenses is $33.2 (much lower than Oun for example). His breakeven point came at 28 units, the sale of which he actually accomplished in the second quarter of his business, since he hardly made any sale in the first quarter. His total loan amounts to $ 5,500, portions of which he borrowed on multiple occasions from both the bank and informal sources. Vanna makes an average monthly profit of $1,710, and ranks 11th.